ORDER NO. AD8805062C9

Service Manual

Compact Disc Player

SL-PJ25

COMPACT disc DIGITAL AUDIO

DIGITAL

Color

(K)...Black Type

Area

Color	Area
(K)	(E).....Continental Europe.
(K)	(EK).....United Kigndom.
(K)	(XL).....Australia.
(K)	(EG).....F.R. Germany.
(K)	(EB).....Belgium.
(K)	(EH).....Holland.
(K)	(EF).....France.
(K)	(Ei).....Italy.
(K)	(XA).....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB).....Saudi Arabia.
(K)	(PC).....European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right stereo)
Frequency response	2–20,000Hz±0.5dB
Output voltage	2V (at 0dB)
Dynamic range	94dB
S/N ratio	96dB
Harmonic distortion	0.003% (1kHz, 0dB)
Total harmonic distortion	0.006% (1kHz, 0dB)
Wow and flutter	Below measurable limit
Output impedance	Approx. 600Ω
Load impedance	More than 10kΩ

■ Signal Format

Sampling frequency	44.1kHz
D-A conversion	16-bit linear

■ Pickup

Wavelength	780nm

■ General

Power supply

For United Kingdom and Australia: AC 240V, 50/60Hz
For Continental Europe: AC 220V, 50/60Hz
For Others: AC 110V/127V/220V/240V, 50/60Hz

Power consumption	11W
Dimensions (W × H × D)	360×90×270mm
Weight	3.2kg

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Panasonic Tokyo Office
Matsushita Electric Industrial Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-chome, Minato-ku,
Tokyo 105, Japan

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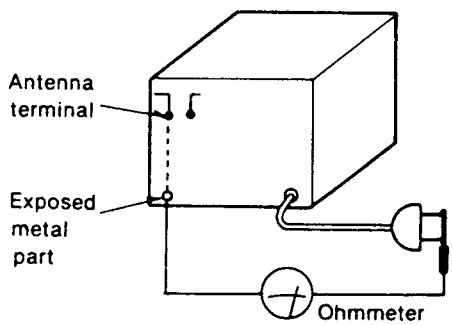
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

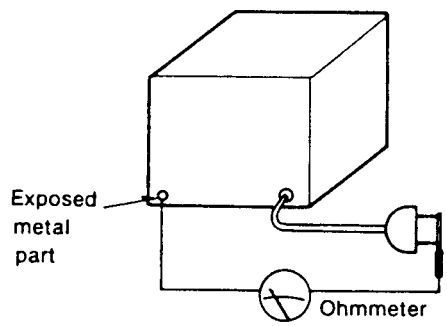
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



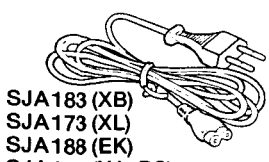
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

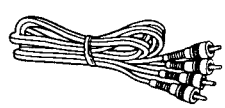
■ ACCESSORIES

- AC power supply cord .. 1
  SFDAC05E03
  (E, EB, EH, EG, EF, Ei)



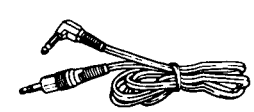
SJA183 (XB)
SJA173 (XL)
SJA188 (EK)
SJA168 (XA, PC)

- Stereo connection cable 1
  (SJP2249-1)



- Synchro-recording connection cable 1
  (SJP2257T)

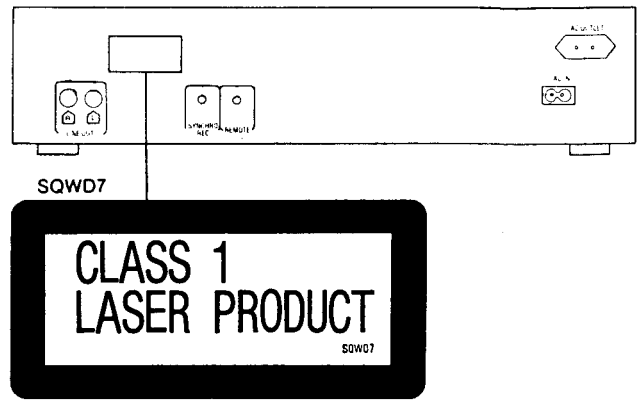
- Remote-control connection cable 1
  (SJP2257T)



D

■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

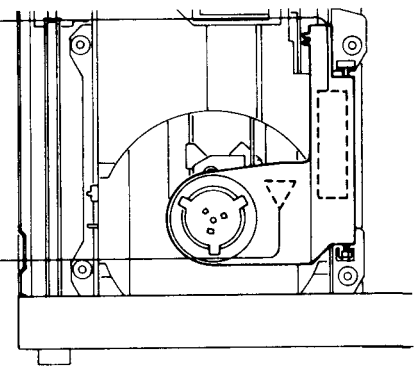


SQWD45

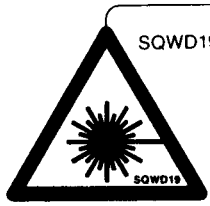
ADVARSEL - Usynligt laserlys udstråles ved åbning.UNDGÅ DIREKTE BESTRÅLING.

DANGER-Invisible laser radiation when open. AVOID DIRECT EX-POSURE TO BEAM.
SQWD45

Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

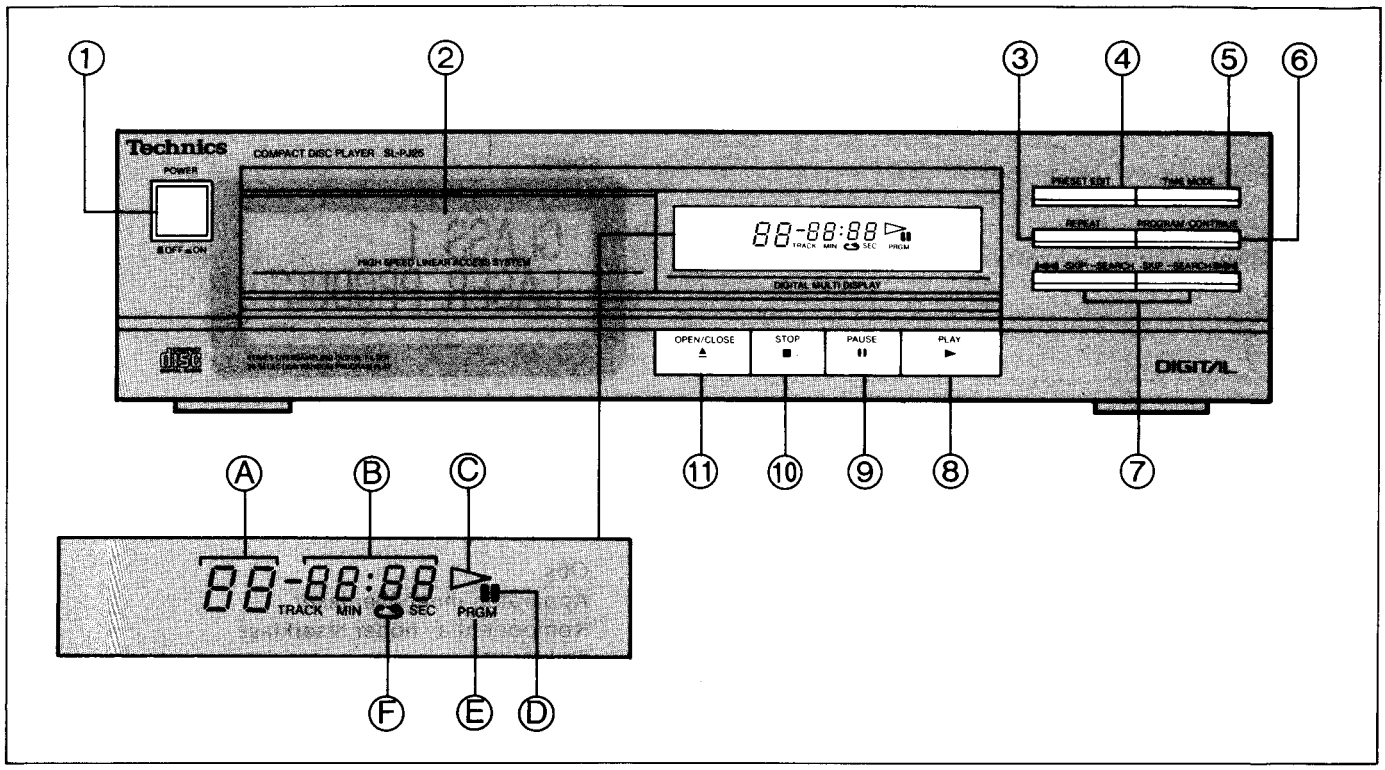


SQWD19



VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① **Power switch (POWER)**

② **Disc tray**

③ **Repeat button (REPEAT)**

④ **Preset edit button (PRESET EDIT)**
This button can be used to specify the playing time.

⑤ **Time-mode select button (TIME MODE)**
Use this button to select the desired time display mode.

⑥ **Programmed-play button (PROGRAM/CONTINUE)**

⑦ **Skip/search buttons (|◀◀-SKIP/—SEARCH ▶▶|)**

⑧ **Play button (PLAY/▶)**

⑨ **Pause button (PAUSE/❚❚)**

⑩ **Stop button (STOP/■)**
This button can be used to stop the disc play, as well as to cancel the various play modes.

⑪ **Disc tray open/close button (OPEN/CLOSE/⏏)**

Indicators section

Ⓐ **Track number display (TRACK)**

Ⓑ **Time display (MIN/SEC)**

Ⓒ **Play indicator (▷)**

Ⓓ **Pause indicator (❚❚)**

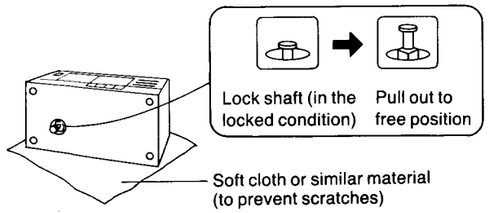
Ⓔ **Programmed-play indicator (PRGM)**

Ⓕ **Repeat indicator (↻)**

■ PLACEMENT

Before placement

The optical pick-up is secured to prevent damage during transport. Be sure to release it before use.

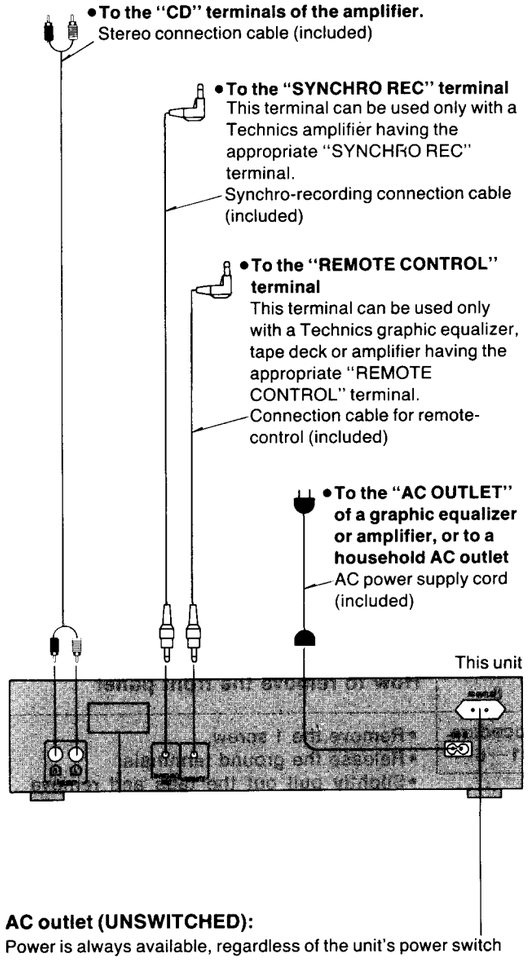


Caution:
Do not transport the unit without locking the lock shaft.
Severe damage will result.
If the unit is transported again, perform the following steps:
1) Remove the disc from the tray and turn off the power.
2) **Place the unit with the rear panel facing downward.**
3) Push the lock shaft to the in (LOCK) position (▙→▂).

Notes for placement

- **Place on a flat, level surface so that the front-rear inclination does not exceed 5°.**
- **Avoid places such as the following:**
- Near any equipment or device that generates strong magnetism.
- On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
- Extremely cold places (5°C or below).
- Near a tuner or TV. (It may cause noise in the broadcast, or disturbance of the TV picture.)
- **Do not place heavy objects, other than system components, on top of the unit.**
- **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
  Always remove the disc before storing the unit for any period of time.
- **To avoid problems due to vibration.**
- Do not place a book or similar object under this unit.
- Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ CONNECTIONS


• To the "CD" terminals of the amplifier.
Stereo connection cable (included)
• To the "SYNCHRO REC" terminal
This terminal can be used only with a Technics amplifier having the appropriate "SYNCHRO REC" terminal.
Synchro-recording connection cable (included)
• To the "REMOTE CONTROL" terminal
This terminal can be used only with a Technics graphic equalizer, tape deck or amplifier having the appropriate "REMOTE CONTROL" terminal.
Connection cable for remote-control (included)
• To the "AC OUTLET" of a graphic equalizer or amplifier, or to a household AC outlet
AC power supply cord (included)
This unit

AC outlet (UNSWITCHED):
Power is always available, regardless of the unit's power switch setting.

This outlet is exclusively for the connection of other audio equipment, such as an amplifier. Be sure the power consumption does not exceed the wattage specified near the AC outlet.

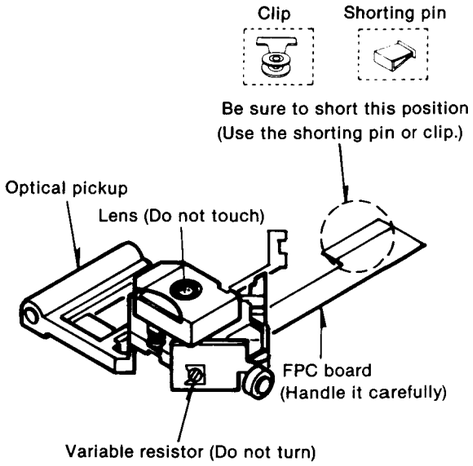
Notes:
1. See the operating instructions of the amplifier for details.
2. The configuration of the AC outlet and AC power supply cord differs according to area.
3. Although the synchro-recording connection cord and the remote-control cord are differentiated in the figure, actually they are the same shape.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

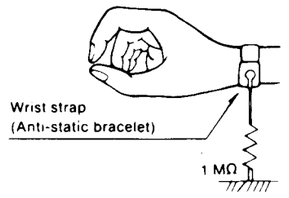
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

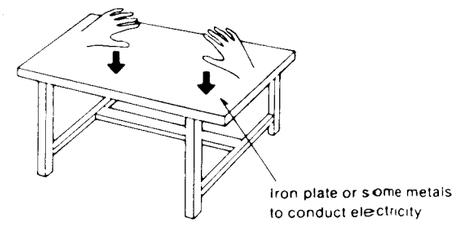


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



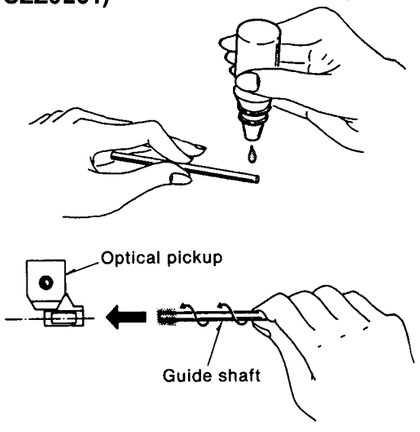


■ INSTRUCTIONS FOR THE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil. Since one application (one shaft) uses 0.05ml of oil.

How to Use

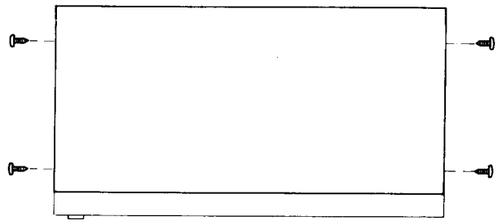
(1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
(2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
(3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
(4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.



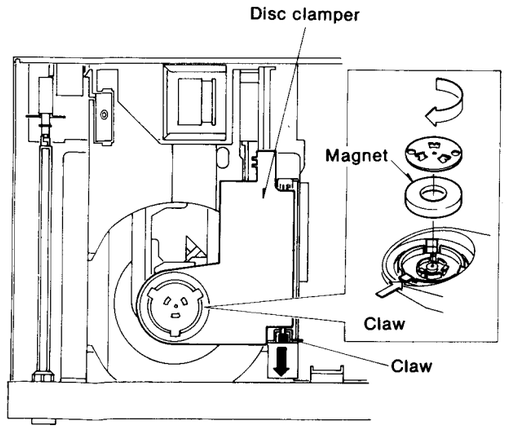
■ DISASSEMBLY INSTRUCTIONS

CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

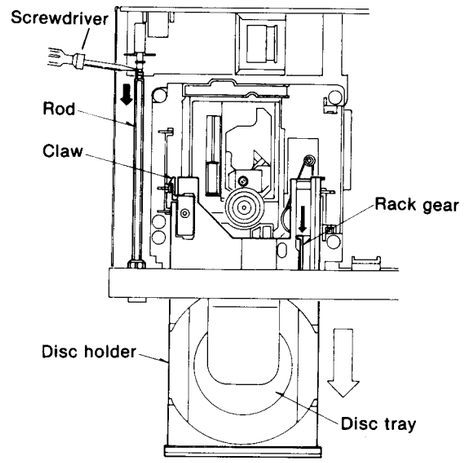
Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 4 screws.



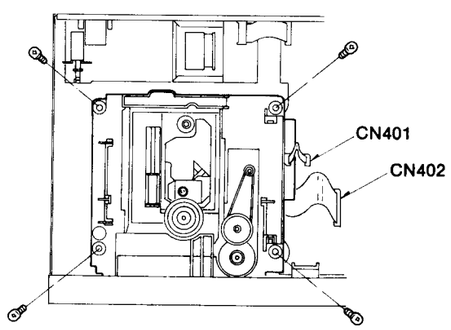
Ref. No. 2	How to remove the disc clamper and magnet
Procedure 1→2	**A. Disc clamper:** • Release the claw. • Lift clamper and pull in the direction of the arrow. **B. Magnet:** • Turn the holder in the direction of the arrow to release the claw.



Ref. No. 3	How to remove the disc holder and power switch rod
Procedure 1→2→3	**A. Disc holder:** 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Release the claw. 4. Pull out the disc holder further to remove it. **B. Power switch rod:** 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver.

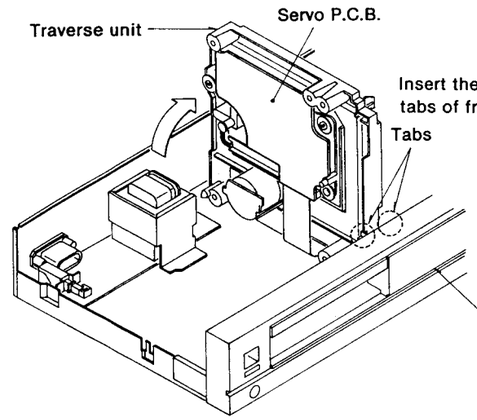


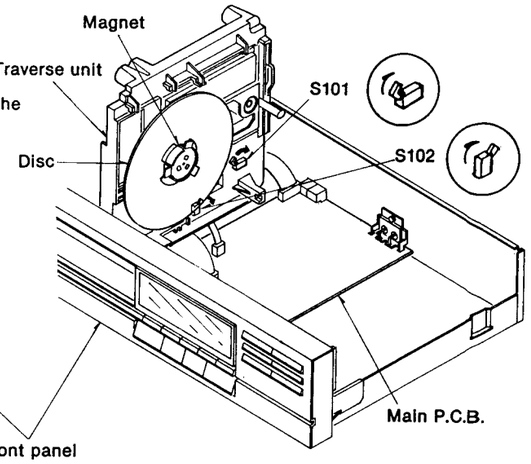
Ref. No. 4	How to remove the traverse unit
Procedure 1→2→3→4	• Remove the 4 screws.



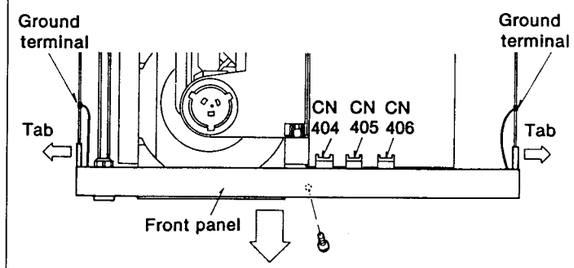
Ref. No. 5	How to check the servo P.C.B.
Procedure 1→2→3→4→5	• When checking the soldered surfaces of the servo P.C.B. and replacing the parts, do as shown.

(To play a disc)
1. Place the test disc and magnet.
2. Turn "ON" the power switch of the player while holding the levers of the switches (S101, S102) in the direction of the arrow.

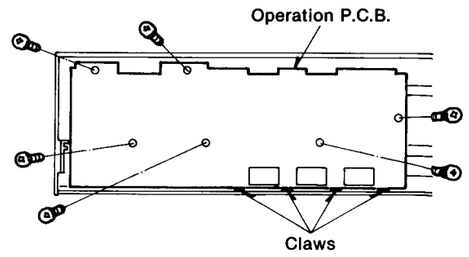




Ref. No. 6	How to remove the front panel
Procedure 1→6	• Remove the 1 screw. • Release the ground terminals. • Slightly pull out the tabs and remove the front panel in the direction of the arrow.



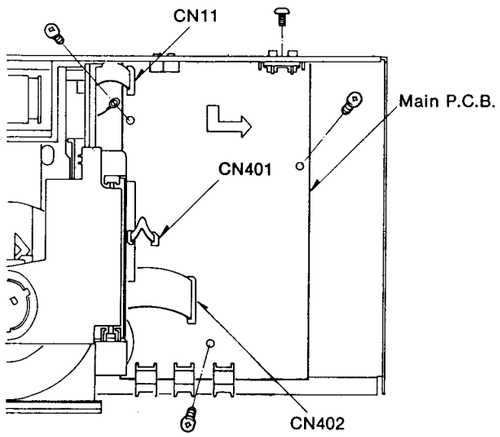
Ref. No. 7	How to remove the operation P.C.B.
Procedure 1→6→7	1. Remove the 6 screws (❶~❻). 2. Release the 4 claws.



Ref. No. 8 — **How to remove the main P.C.B.**

Procedure 1→6→8

1. Remove the 4 screws.
2. Lift the P.C.B. remove it from the chassis tab.
3. Remove the P.C.B. in the direction of the arrow.

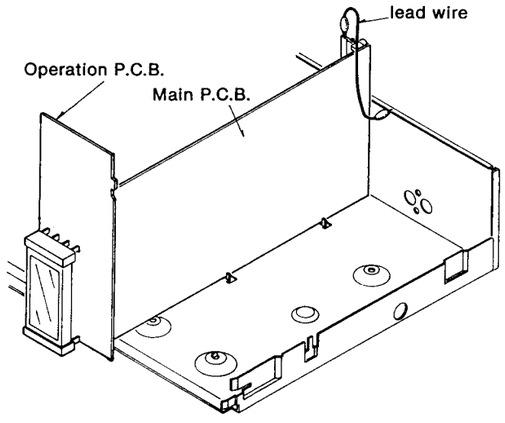


How to check the main P.C.B.

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

Cautions:

- Be sure to connect the P.C.B. ground terminal (line out terminal) and the chassis with a lead wire.
- Be sure to connect the GND lead wire from the loading base to the chassis.



Ref. No. 9 — **How to remove the servo P.C.B. and loading motor P.C.B.**

Procedure 1→2→3→4→9

A. Servo P.C.B.

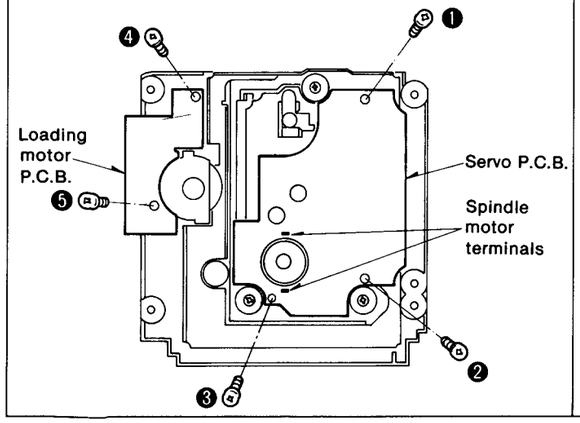
1. Remove the 3 screws (❶~❸).
2. Unsolder the 2 terminals of spindle motor.
3. Remove the FPC cord from the optical pickup.

Caution:

Be sure to short the FPC cord within 20 seconds after removal to prevent breakdown of the laser diode.

B. Loading motor P.C.B.

1. Remove the 2 screws (❹, ❺).

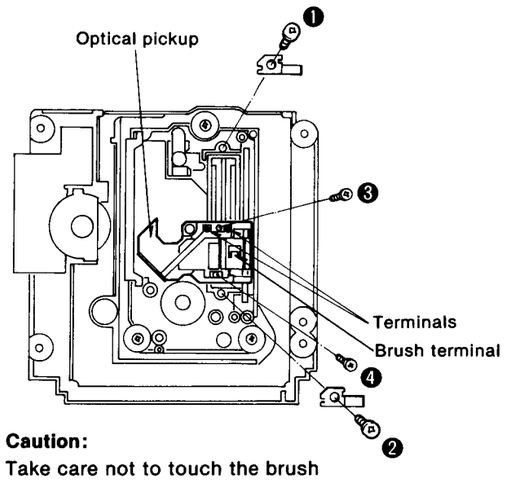


Ref. No. 10 — **How to remove the optical pickup**

Procedure 1→2→3→4→9→10

Refer to the optical pickup handling precautions and instructions for the oil (See page 6).

1. Remove the 2 screws (❶, ❷).
2. Unsolder the 2 terminals and the 2 screws (❸, ❹).



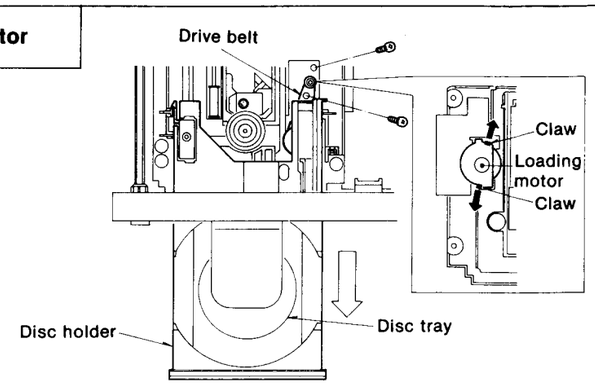
Caution:

Take care not to touch the brush terminal.

Ref. No. 11 — **How to remove the loading motor**

Procedure 1→2→3→4→11

1. Remove the drive belt.
2. Remove the 2 screws.
3. Turn traverse unit over.
4. Release the claws.
5. Unsolder the terminals.



Ref. No. 12 — **How to remove the spindle motor**

Procedure 1→2→3→4→9→12

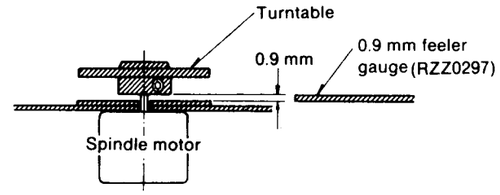
1. Loosen the screw (❶) by using a 1.27mm hexagonal wrench and remove the turntable.
2. Remove the 2 screws (❷, ❸).

Caution:

1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+) terminal of the spindle motor is indicated by the red mark.

Adjustment of turntable height

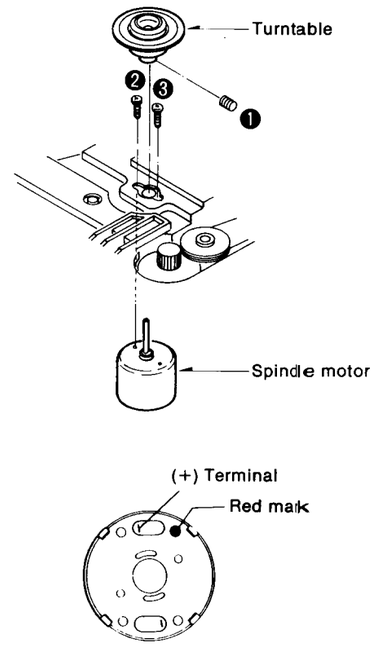
1. Insert a 0.9mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.



2. Tighten the turntable set-screw by using a 1.27mm hexagonal wrench.

Caution:

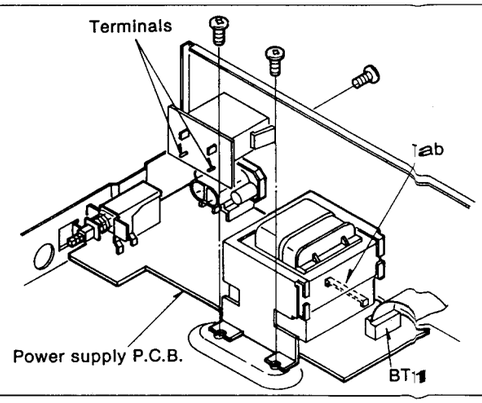
Refer to turntable height adjustment (see page 16).



Ref. No. 13 — **How to remove the power transformer**

Procedure 1→2→3→4→13

1. Remove the connector (BT11).
2. Remove the 3 screws.
3. Release the Tab.
4. Unsolder the terminals.



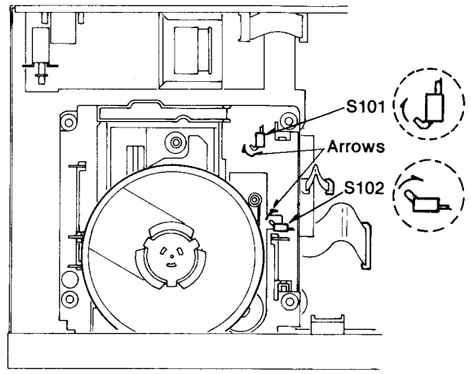
■ MEASUREMENTS AND ADJUSTMENTS

Caution:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
  With the unit turned "on", laser radiation is emitted from the pickup lens.
  Avoid exposure to the laser beam, especially when performing adjustments.

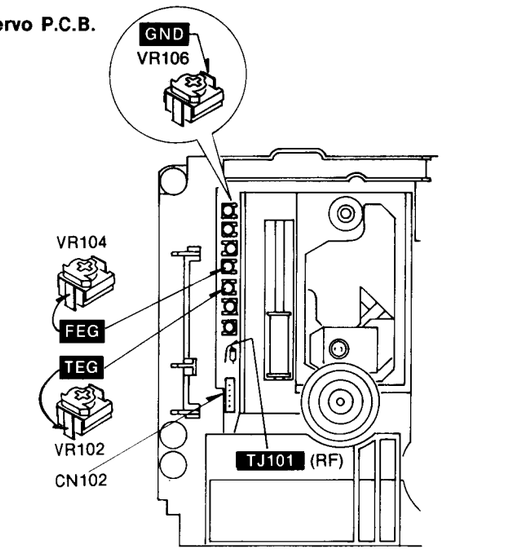
PREPARATION

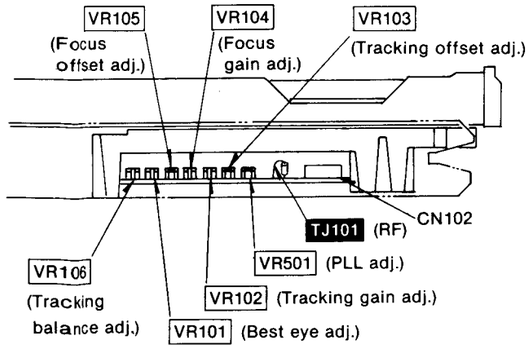
1. Remove the cabinet. (Refer to page 7.)
2. Remove the disc clamper and magnet. (Refer to page 7.)
3. Remove the disc holder and power switch rod. (Refer to page 7.)
4. Place the test disc and magnet on the turntable.
5. Turn "ON" the power switch of the player, while holding the levers of the switches (S101, S102) in the direction of the arrow.
6. Release the levers of the switches (S101, S102) after the test disc starts rotating.



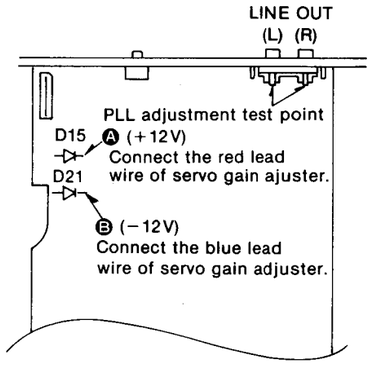
ADJUSTMENT POINTS

• **Servo P.C.B.**





• **Main P.C.B.**



ELECTRICAL ADJUSTMENT

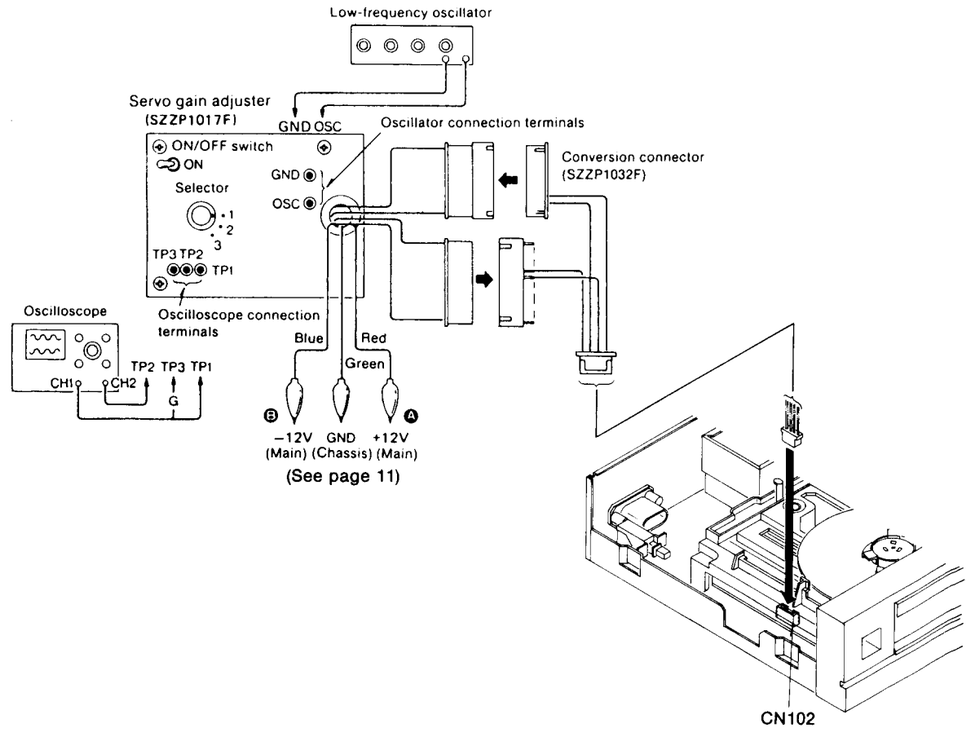
Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector(SZZP1032F)

Adjustment Procedure

Step 1: Make the temporary setting of each VR . (Refer to page 13.)
↓
Step 2: Best eye (PD balance) adjustment. (Refer to page 13.)
↓
Step 3: Connect the servo gain adjuster. (Refer to page 12.)
↓
Step 4: Focus gain adjustment. (Refer to page 13.)
↓
Step 5: Tracking gain adjustment. (Refer to page 13.)
↓
Step 6: Focus offset adjustment (Refer to page 14.)
↓
Step 7: Tracking offset adjustment. (Refer to page 14.)
↓
Step 8: Tracking offset balance adjustment.(Refer to page 14.)
↓
Step 9: Disconnect the servo gain adjuster.
↓
Step 10: PLL adjustment. (Refer to page 15.)
↓
Step 11: Check of play operation after adjustment. (Refer to page 15.)

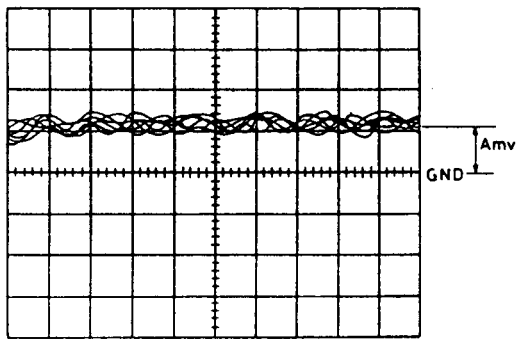
Connection of Servo Gain Adjuster



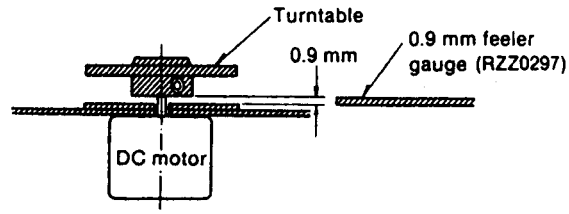
D

TURNTABLE HEIGHT ADJUSTMENT

1.Connect CH1 of the oscilloscope to **FEG** (+) and **GND** (-) of the servo P.C.B.through the filter as shown below.
Oscilloscope setting:VOLT.....50mV
SWEEP.....1msec.
INPUT.....DC
2.Set the oscilloscope to DC zero balance.
3.Set a test disc (SZZP1014F or SZZP1054C and turn **ON** the power switch of the player.(Refer to page 11.)
4.Set the player to the play mode.
5.Measure the DC level (AmV) displayed on the oscilloscope.
● If the value of A is within the range of ± 60mV , the turntable height is correct. If it is not within this range , make the necessary adjustments using the 0.9mm feeler gauge (RZZ0297).
If A is more than +60mV , make the turntable lower.
If A is less than -60mV , make the turntable higher.

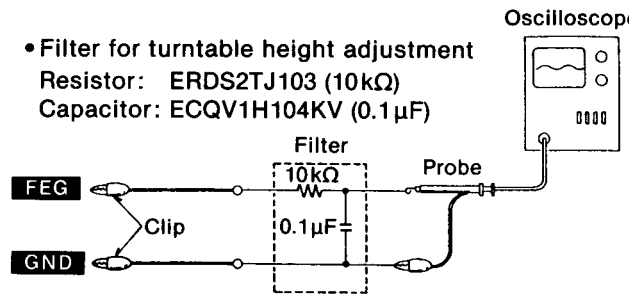


Adjust the turntable height as follow:
A.Insert the 0.9mm feeler gauge (RZZ0297) as shown below.



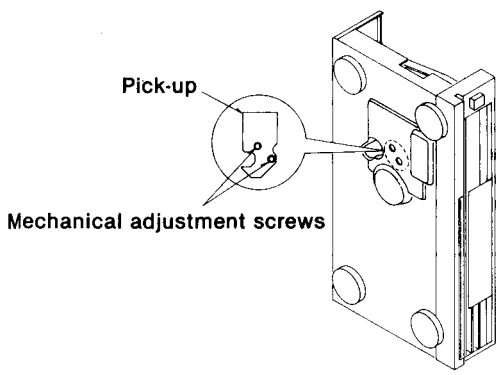
B.Loosen the turntable set-screw.
C.Adjust turntable height to 0.9mm with the feeler gauge as shown above.
D.Tighten the turntable set-screw by using the 1.27mm hexagonal wrench.
E.Check the turntable height adjustment by following steps 1 ~ 5 above.

• Filter for turntable height adjustment
Resistor: ERDS2TJ103 (10kΩ)
Capacitor: ECQV1H104KV (0.1μF)

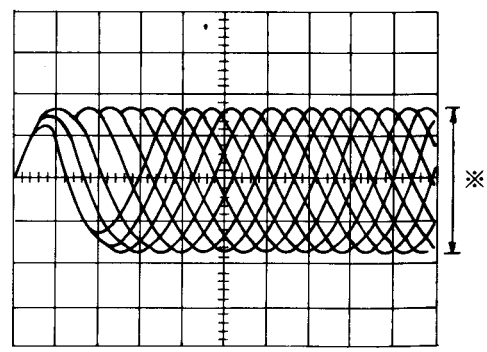


MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC
2.Set the test disc (SZZP1056C) and turn **ON** the power swith of the player.(Refer to page 11.)
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.



4.Monitoring RF signal on the oscilloscope, adjust **the two adjusting screws** alternatelywith the 2.0mm hexagonal wrench so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.

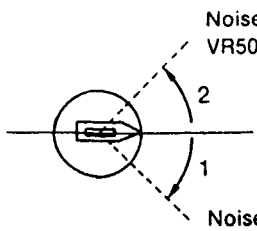


Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

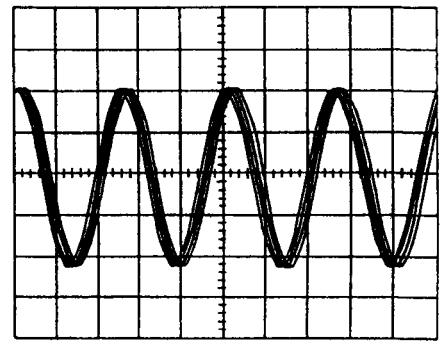
D

PLL ADJUSMENT

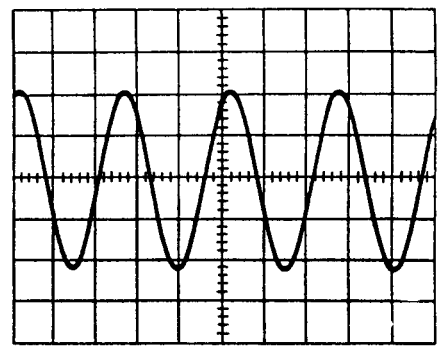
1.Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground.**
Oscilloscope setting:VOLT.....1V
SWEEP.....1msec.
INPUT.....DC
2.Set the test disc (SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 11.)
3.Play **Track No.6 (wedge 0.7mm)** of the test disc.
4.Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.
Step 1. Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 2. Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 3. Set **VR501** in the middle between the points observed in the above steps " 1 " and " 2 " .


Noise started to appear in output sound with VR501 turned counterclockwise.
2
Final setting point.
1
Noise started to appear in output sound with VR501 turned clockwise.

• NG



• OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search
1.Play an ordinary disc.
2.Press the skip button and verify skip search operation (forward and reverse).

Check of manual search
1.Play an ordinary disc.
2.Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability
1.Play the test disc (SZZP1054C).
2.Play the track No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3.Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (2.0mm)
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter **(Refer to page 16)**

Adjustment Procedure

- If the optical pickup and spindle motor are replaced , adjust it according to the following procedure.

Step 1: Make the temporary of each VR.(Refer to page 13.)

Step 2: Turntable height adjustment. (Refer to page 16.)

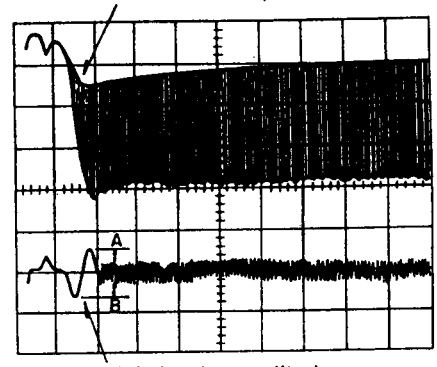
Step 3: Mechanical adjustment. (Refer to page 16.)

Step 4: Electrical adjustment. (Refer to page 12.)

D

FOCUS OFFSET ADJUSTMENT

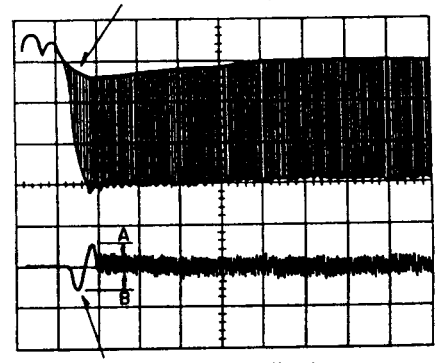
1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Connect CH2 of the oscilloscope to **FEG** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV(CH1),
500mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Set the test disc (SZZP1057C) and turn **ON** the power switch of the player.(Refer to page 11.)
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

TRACKING OFFSET ADJUSTMENT

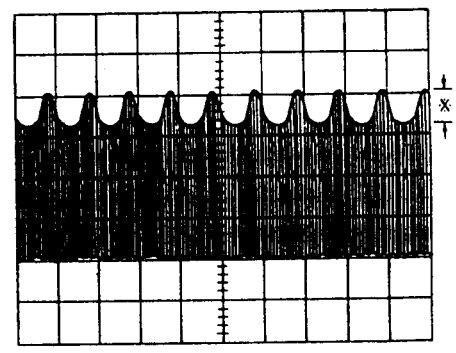
1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Connect CH2 of the oscilloscope to **TEG** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV(CH1),
500mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Set the test disc (SZZP1057C) and turn **ON** the power switch of the player.(Refer to page 11.)
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103**, so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

TRACKING OFFSET BALANCE ADJUSTMENT

1.Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
2.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-)of the servo P.C.B.
Oscilloscope setting:VOLT.....500mV
SWEEP.....0.5msec.
INPUT.....AC
2.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 11.)
4.Set the player to the play mode.
5.Set the selector switch of the servo gain adjuster from **"2"** to **"1"**.
6.Adjust **VR106**, so that the output waveform is as shown (jitter is minimized).
7.Shift the selector switch of the servo gain adjuster from **"1"** to **"2"**.
8.Turn **OFF** the power switch of the player.
9.Disconnect the servo gain adjuster.

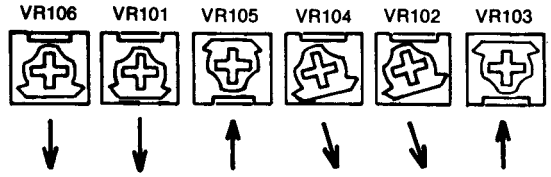


*Jitter should be minimized.

D

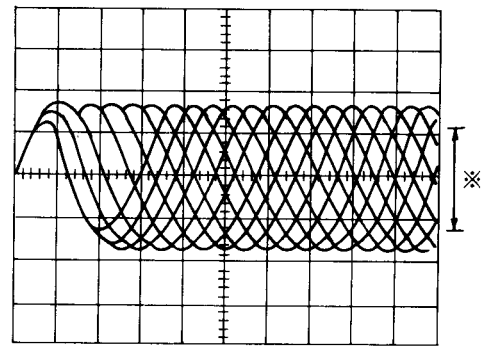
TEMPORARY SETTING OF EACH VR

Note :
If a disc skips or can not be played back, adjust each VR temporarily, as shown.



BEST EYE(PD BALANCE) ADJUSTMENT

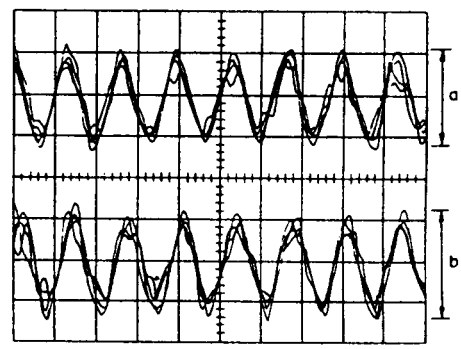
1.Connect CH1 of the oscilloscope to **TJ101** (+) and **GND** (-) of the servo P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC
2.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 11.)
3.Set the player to the play mode.
4.Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.
5.Turn **OFF** the power switch of the player.



※ Most stretched eye pattern.

FOCUS GAIN ADJUSTMENT

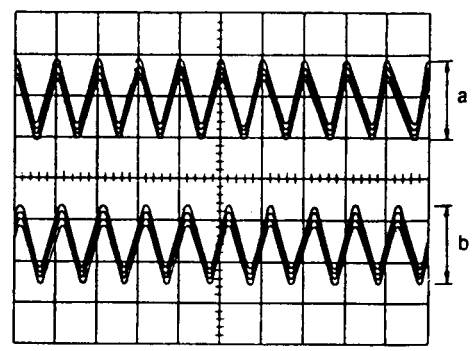
1.Connect the servo gain adjuster.(Refer to page 12.)
2.Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON.**
3.Set the low frequency oscillator to a frequency of **825Hz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4.Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(**TP3** is the ground terminal.)
Oscilloscope setting:VOLT.....100mV(both channels)
SWEEP.....1msec.
INPUT.....DC
5.Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player.(Refer to page 11.)
6.Set the player to the play mode.
7.Set the selector switch of the servo gain adjuster from **"2" to "3".**
8.**825Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9.Shift the selector switch of the servo gain adjuster from **"3" to "2".**



* Make a=b

TRACKING GAIN ADJUSTMENT

1.Oscilloscope setting and connections are the same as above.
2.Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p.**
3.Set the selector switch of the servo gain adjuster from **"2" to "1".**
4.**1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
5.Shift the selector switch of the servo gain adjuster from **"1" to "2".**



*Make a=b

D

■ TERMINAL FUNCTION OF LSI

● MN6617S (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Division	Function
1	BLKCK	O	Sub-code block (Q data) clock (75Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (Not used, connected to GND)
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, open)
15	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (Not used, open)
17	X1	I	Clock input
18	SEL	I	DA output parallel/serial selection (serial at "L") (Not used, connected to GND)
19	LDG/WDC	O	L channel deglitch signal/serial data word clock. (Not used, open)
20	RDG	O	Clock signal output for spindle motor control (Not used, open)
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H") (Not used, open)
22	IPFLAG	O	Interpolation flag (interpolation at "H") (Not used, open)
23	FLAGO	O	Error flag (error at "H") (Not used, open)
24	FLAG6	O	16K RAM address reset signal (reset at "H") (Not used, open)
25	XCK	O	Clock (16.9344MHz) output (Not used, open)
26	SRDATA	O	Serial data output (MSB first)
27	SRDATA	O	Serial data output (LSB first) (Not used, open)
28	SRCK	O	Serial data beat clock.
29	WDCK	O	Serial data word clock (Not used)
30	BYTCK	O	Serial data byte clock (Not used, open)
31	GND	I	GND terminal
32	R/L	O	R/L signal

Pin No.	Mark	I/O Division	Function
33	RESY	O	Resynchronizing signal (Not used, open)
34	FCLV	O	Synchronizing detection signal (Not used, open)
35	IPBYTE	O	Interpolation flag for each byte (Not used, open)
36	IPSEL	I/O	Interpolation prohibited (Not used, connected to GND)
37	FLAG5	O	C2 decoder correction flag 3 (Not used, open)
38	FLAG4	O	C2 decoder correction flag 2 (Not used, open)
39	FLAG3	O	C2 decoder correction flag 1 (Not used, open)
40	FLAG2	O	C1 decoder correction flag 2 (Not used, open)
41	FLAG1	O	C1 decoder correction flag 1 (Not used, open)
42	FLCK	O	Crystal frame clock
43 ∫ 50	D7 ∫ D0	I/O	16K RAM data output
51	RAMOE	O	16K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16K RAM $\overline{\text{WE}}$ signal
53 ∫ 63	RAMA0 ∫ RAMA10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input (Not used, open)
67	VCNT	—	(Not used, open)
68	REXT	—	(Not used, open)
69	VDD	I	Power supply (+5V)
70	PD	—	(Not used, open)
71	PCKO	—	(Not used, open)
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H") (Not used, open)
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal. (Not used, open)
80	SRFO	—	(Not used, open)
81	NSRF	—	(Not used, open)
82	RF	—	(Not used, open)
83	SUBC	O	Sub-code serial output data (Not used, open)
84	SBCK	I	Clock for sub-code serial output (Not used, open)

● AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Division	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE(+)	I	Phase difference to voltage conversion (+)
9	TE(−)	I	Phase difference to voltage conversion (−)
10	APC(−)	I	Laser power inversion input
11	C.MEM	I	Capacitor connection for phase difference memory
12	APC(+)	I	Laser power non inversion input
13	VREFE	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Trackcrossing speed control output (Not used, open)
18	C.MSP	I	Trackcrossing reference speed setting capacitor connection (Not used, open)
19	C.AF	I	Auto focus timer capacitor connection
20	KICK	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input (FOON Focus servo "ON" signal)

Pin No.	Mark	I/O Division	Function
23	CNT2	I	Control input (TRON Tracking servo ON signal)
24	CNT3	I	Control input (KICKF Kick direction [Foward] command)
25	CNT4	I	Control input (KICKR Kick direction [Reverse] command)
26	F.LOCK	O	Focus lock signal output
27	C.FBDO	O	Capacitor connection for inversion RF high detection
28	C.SBDO	O	Capacitor connection for inversion RF low detection
29	C.SBRT	O	Capacitor connection for non-inversion RF slow detection
30	C.FBRT	O	Capacitor connection for non-inversion RF fast detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RF IN	I	RF signal input
34	S.OUT	O	Focus search signal output
35	C.LW	I	Capacitor connection for triangular wave generation
36	FE.OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE.REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detection current input (B)
40	IVB	O	Current/voltage conversion (B)
41	IVA	O	Current/voltage conversion (A)
42	PDA	I	Photo detection current input (A)

● AN8371S (Data slice and PLL)

Pin No.	Mark	I/O Division	Function
1	VEE	I	Power supply (connected to −5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D.GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free run frequency adjusting current input (not connected)
8, 9	VC1, 2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection

Pin No.	Mark	I/O Division	Function
13	PL2	I	PLL loop filter connection
14	FPC	I	Frequency comparison error signal input
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC output
17	AGC	I	ARF signal input for AGC drop-out detection input
18	AC	I	Loop filter for AGC connected
19	DO	O	Drop-out detection pulse output
20	A.GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicing
22	SLC	I	Slicing level control signal input
23	FC1	I	Filter capacitor for data slicer connected
24	FC2	I	Filter capacitor for data slicer connected

● MN1554PEP (System Control)

Pin No.	Mark	I/O Division	Function
1	BRECV	—	(Not used, open)
2	BSEND	—	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to +5V)
5	BLKCK	I	Sub-code block (Q data) clock input (75Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 ∫ 13	P20 ∫ P23	O	Not used (connected to +5V)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	–	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply (connected to +5V)
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)

Pin No.	Mark	I/O Division	Function
29	CLOSE	I	Disc holder "Open" detection
30	OPEN	I	Disc holder "Close" detection
31	BCLK	I	(Not used, connected to GND)
32	BDATA	I	(Not used, connected to GND)
33	STAT	I	Processing status input from signal processing LSI
34	COMP	O	TOC reading control (ON at "L") (connected to GND)
35	FLOCK	I	Optical servo condition (focus) input
36	SENSE	I	Optical servo condition (track cross) input
37	RECV	I	Data receipt command signal
38	SEND	I	Data transmission command
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 ∫ 44	DATA0 ∫ DATA3	I	Key scan signal
45 ∫ 52	NC	I	Not connected
53	OSC2	I	Clock terminal
54	OSC1	I	Clock input
55	X1	I	Optical servo condition input
56	X0	O	(Not used, open)
57	GND	I	GND terminal
58	DMUTE	O	Muting control
59	MDATA	O	Command data output
60	MCLK	O	Data clock output (command clock)
61	MLD	O	Data output (command load)
62	DOUTON	O	Optical output control signal (Not used, open)
63	EMPH	O	Emphasis signal output
64	NC	—	Not connected

● MN152611PEN (FL Drive and Timing Signal Generator)

Pin No.	Mark	I/O Division	Function
1	VSS	I	GND terminal
2	X0	O	(Not used, open)
3	XI	I	Optical servo condition input (Not used, open)
4 ∫ 7	P00 ∫ P03	O	Key scan signal
8	P10(CLK)	O	Data lock signal
9	P11(ACK)	O	Data discrimination signal
10	P12(SEND)	O	Data transmission command signal
11	P13(RECV)	O	Data receipt command signal
12	$\overline{SYNC}$	O	(Not used, open)
13	$\overline{RST}$	I	Reset signal input (reset at "L")
14	$\overline{IRQ/TC1}$	I	Sub-code block (Q data) clock (75Hz) input (Not used, open)
15 ∫ 18	P50 ∫ P53	I	Key return signal
19	$\overline{SBT}$	I	Sub-code frame clock (7.35kHz) (Not used, open)
20	$\overline{SBD}$	I	Sub-code Q data input (Not used, open)
21 ∫ 24	P20 ∫ P23	O	Key scan signal
25	P30	—	(Not used, open)
26	P31	—	(Not used, open)
27	P32	I	(Not used, connected to +5V)
28	P33	—	(Not used, open)
29 ∫ 31	P40 ∫ P42	I	(Not used, connected to +5V)

Pin No.	Mark	I/O Division	Function
32	P43	I	Remote control signal input
33	PE0	O	Synchro rec control terminal
34	PE1	O	
35	P60	O	(Not used, open)
36	P61	O	(Not used, open)
37	DAC	O	(Not used, open)
38	VPP	I	FL drive power supply (connected to −33V)
39	D0	O	FL grid signal (Not used, open)
40	D1	O	FL grid signal (Not used, open)
41	D2	O	FL grid signal
42	D3	O	FL grid signal (Not used, open)
43 ∫ 46	D4 ∫ D7	O	FL grid signal
47 ∫ 49	D8 ∫ DA	O	FL grid signal (Not used, open)
50 • 51	DB • DC	O	FL grid signal
52	DD	O	FL grid signal (Not used, open)
53 ∫ 61	S8 ∫ S0	O	FL anode signal
62	VDD	I	Power supply (connectid to +5V)
63	OSC2	I	Clock terminal
64	OSC1	I	Clock input

● MN6623 (Digital Filter and D/A Converter)

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset signal input (reset at "L")
3	IE	I	I²S select terminal ("H"=I²S)
4	TP1	—	TEST terminal (Not connected)
5	TP2	—	
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9	NC	—	Not connected
10	AVDD4	I	Power supply (connected to +5V)
11	OUTR(−)	O	Rch data output, (−) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTR(+)	O	Rch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +5V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +5V)
18	OUTL(−)	O	Lch data output, (−) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTL(+)	O	Lch data output, (+) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +5V)
23	AVDD1	I	Power supply (connected to +5V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +5V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Not used (connected to GND)
31	768fs	O	768 fs (Not used)
32	192fs	O	192 fs (Not used)
33	LRPOL	I	LR clock selector (Not used)
34	LR	I	L/R clock
35	SRCK	I	Serial data best clock
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	NC	—	Not connected
39	384 fs	O	384 fs (16.9344MHz) output
40	PD	I	Power down terminal
41	MDATA	I	Command data input
42	MCLK	I	Command clock input

■ REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC11		LM2940T5	I.C. REGULATOR
IC13		BA4558FT1	I.C. REGULATOR
IC101		AN8370S	I.C. OPTICAL SERVO
IC102		MN6636	I.C. ANALOG SW.
IC103		AN6554NS	I.C. OPERATION AMP.
IC104		AN6552S	I.C. REGULATOR
IC105		AN6552S	I.C. REGULATOR
IC106		AN6552S	I.C. REGULATOR
IC201		LM2940T5	I.C. REGULATOR
IC202		AN6552S	I.C. REGULATOR
IC301		MN6617S	I.C. LSI
IC302		SVICXK5816M	I.C. 16K RAM
IC401		MN1554PEP	I.C. LSI
IC402		BA4558FT1	I.C. REGULATOR
IC501		AN8371S	I.C. DATA SLICE PLL
IC601		MN152611PEN	I.C. OPERATION AMP
IC801		MN6623	I.C. DF DAC
IC803		LM833M	I.C. COMPARATOR
IC804		NJM4560M	I.C. LPF
IC805		SVIH8DN2175	I.C. LPF
IC806		SVIH8DN2175	I.C. LPF
TRANSISTORS			
Q11		2SB1240QRTV6	TRANSISTOR
Q12		2SB1238QSTV3	TRANSISTOR
Q16		2SD1862QRTV3	TRANSISTOR
Q101		2SA1547-Q	TRANSISTOR
Q141		2SD1862-P	TRANSISTOR
Q142		2SB1240-P	TRANSISTOR
Q161		2SD1862-P	TRANSISTOR
Q162		2SB1240-P	TRANSISTOR
Q181		2SD1862-P	TRANSISTOR
Q182		2SB1240-P	TRANSISTOR
Q201		2SD1862-P	TRANSISTOR
Q203		2SD1862-P	TRANSISTOR
Q301		DTC124ES	TRANSISTOR
Q351		DTA124EST	TRANSISTOR
Q401		2SD1862QRTV3	TRANSISTOR
Q402		2SB1240QRTV6	TRANSISTOR
Q403		2SD1862QRTV3	TRANSISTOR
Q404		2SB1240QRTV6	TRANSISTOR
Q405		DTC124ES	TRANSISTOR
Q406		DTC124ES	TRANSISTOR
Q407		DTC124ES	TRANSISTOR
Q408		DTA113ZST	TRANSISTOR
Q409		DTC124ES	TRANSISTOR
Q801		2SC3311QRSTA	TRANSISTOR
Q802		2SC3311QRSTA	TRANSISTOR
Q803		2SD1330R	TRANSISTOR
Q804		2SD1330R	TRANSISTOR
Q851		DTA124EST	TRANSISTOR
Q852		DTC124ES	TRANSISTOR
Q853		DTA114EST	TRANSISTOR
Q854		DTC124ES	TRANSISTOR
Q855		DTA124EST	TRANSISTOR
Q856		DTA124EST	TRANSISTOR
DIODES			
D11	⚠	SVD1SR35200A	RECTIFIER
D12	⚠	SVD1SR35200A	RECTIFIER
D13	⚠	SVD1SR35200A	RECTIFIER
D14	⚠	SVD1SR35200A	RECTIFIER
D15	⚠	SVD1SR35200A	RECTIFIER
D16		MA4330MHTA	DIODE, SI
D17	⚠	SVD1SR35200A	RECTIFIER
D18		MA4062MHTA	DIODE, SI
D19		MA4062HTA	DIODE
D21	⚠	SVD1SR35200A	RECTIFIER
D22	⚠	SVD1SR35200A	RECTIFIER
D181		MA165	DIODE
D182		MA165	DIODE
D183		MA165	DIODE
D184		MA165	DIODE
D201		MA4056-M	DIODE
D401		SVD1SS254	DIODE
D410		MA4033	DIODE
D411		SVD1SS254	DIODE
D422		SVD1SS254	DIODE
D601		SVD1SS254	DIODE
D602		SVD1SS254	DIODE
D603		SVD1SS254	DIODE
D604		SVD1SS254	DIODE
D606		SVD1SS254	DIODE
D607		SVD1SS254	DIODE
D851		SVD1SS254	DIODE
D852		SVD1SS254	DIODE
D853		SVD1SS254	DIODE
D854		SVD1SS254	DIODE
D855		SVD1SS254	DIODE
D856		SVD1SS254	DIODE
D857		SVD1SS254	DIODE
I.C.PROTECTORS			
ICP1 (EK, PC, XA)	⚠	SRUF38	I.C.PROTECTOR
ICP2 (EK, PC, XA)	⚠	SRUF38	I.C.PROTECTOR
ICP11 (EK)	⚠	SRUN15	I.C.PROTECTOR
ICP12 (EK)	⚠	SRUN15	I.C.PROTECTOR
VARIABLE RESISTORS			
VR101		EVND3AA00B53	V.R. BEST EYE ADJ.
VR102		EVND3AA00B14	V.R. TR GAIN ADJ.
VR103		EVND3AA00B14	V.R. TR OFFSET ADJ.
VR104		EVND3AA00B14	V.R. FO GAIN ADJ.
VR105		EVND3AA00B14	V.R. FO OFFSET ADJ.
VR106		EVND3AA00B53	V.R. TR BALANCE ADJ.
VR501		EVND3AA00B13	V.R. PLL ADJ.
MAGNET RESISTOR ELEMENTS			
RA1		EWS7L0A00Q53	RESISTANCE UNIT
COILS AND TRANSFORMERS			
L1 (EG, EH, EB) (EF, EI, E)	⚠	SLQX400-D	COIL
L2 (EG, EH, EB) (EF, EI, E)	⚠	SLQX400-D	COIL
T1 (EG, EH, EB) (EF, EI, E)	⚠	SLTD5K028SE	POWER TRANSFORMER
T1 (EK, XL)	⚠	SLTD5K029SG	POWER TRANSFORMER
T1 (XA, PC, XB)	⚠	SLTD5K030SX	POWER TRANSFORMER
OSCILLATORS			
X801		SVQ49U338S	OSCILLATOR
DISPLAYS			
FL601		SAD7MT89ZK	DISPLAY
FUSES			
F1 (EG, EH, EB) (EK, EF, EI) (XL, E)	⚠	XBA2C012TB0	FUSE, 250V, T125mA
F1 (XA, PC, XB)	⚠	XBA2C025TB0	FUSE, 250V, T250mA
F2 (EG, EH, EB) (EF, EI, E)	⚠	XBA2C08TB0	FUSES 250V,T800MA

Ref. No.	Part No.	Description
SWITCHES		
S1 ⚠	ESB8249V	SW, POWER
S2 ⚠ (XA, PC, XB)	SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD17	SW, LOADING DET.
S102	SSPD18	SW, LOADING DET.
S601	EVQQS405K	SW, OPEN/CLOUSE
S602	EVQQS405K	SW, STOP
S603	EVQQS405K	SW, PAUSE
S604	EVQQS405K	SW, PLAY
S605	EVQQS405K	SW, REPEAT
S606	EVQQS405K	SW, PRGM/CONT/MEMO
S607	EVQQS405K	SW, BACKWARD
S608	EVQQS405K	SW, FORWARD
S609	EVQQS405K	SW, PRE EDIT
S610	EVQQS405K	SW, TIME MODE
JACKS		
JK401	SJJ130-3	JACK, SYNCRO REC
JK402	SJJ130-2	JACK(REMOTE)
JK801	SJFD4	OUTPUT TERMINAL(PHONO)

Ref. No.	Part No.	Description
PACKING MATERIAL		
P1 (EG, EH, EB) (EK, EI, XA) (XL, PC, E, XB)	SPND313	CARTON BOX
P1 (EF)	SPND314	CARTON BOX
P2	SPSD149	PAD(REAR)(REAR)
P3	SPSD148	PAD(FRONT)(FRONT)
P4	XZB50X50A01	PROTECTION BAG
P5	SPSD101	PROTECTION SHEET
P6	XZB23X20C03	PROTECTION BAG
P7	SPSD152	ACCESSORY BOX
ACCESSORIES		
A1 ⚠ (EG, EH, EB) (EF, EI, E)	SFDAC05E03	POWER CORD
A1 ⚠ (XA, PC)	SJA168	POWER CORD
A1 ⚠ (XL)	SJA173	POWER CORD
A1 (XB)	SJA183	POWER CORD
A1 ⚠ (EK)	SJA188	POWER CORD
A2	SJP2249-1	OUTPUT CORD
A3	SJP2257T	CORD, SYNCHRO REC
A4 (XL, XA)	SQUD331	INSTRUCTION BOOK
A4 (EK)	SQUD333	INSTRUCTION BOOK
A4 (EG)	SQUD334	INSTRUCTION BOOK
A4 (EF)	SQUD335	INSTRUCTION BOOK
A4 (EI)	SQUD336	INSTRUCTION BOOK
A4 (PC)	SQUD337	INSTRUCTION BOOK
A4 (XB)	SQULPJ25-KB	INSTRUCTION BOOK
A4 (EH, EB, E)	SQULPJ25-KE	INSTRUCTION BOOK
A6 (XA, PC, XB)	RJP120ZBS-H	AC PLUG ADAPTOR

■ RESISTORS AND CAPACITORS

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Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

- Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
- Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 % −20
ECQM	: Poyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC		D : ±0.5pF
ECUX	: Ceramic (Chip Type)	(UL)		
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R11	ERDS2TJ101	100 1/4
R12	ERDS2TJ331	330 1/4
R13	ERDS2TJ103	10K 1/4
R14	ERDS2TJ103	10K 1/4
R16	ERDS2TJ102	1K 1/4
R25	ERDS2TJ471	470 1/4
R101	ERJ6GEYJ154V	150K 1/10
R102	ERJ6GEYJ472V	4.7K 1/10
R103	ERJ6GEYJ472V	4.7K 1/10
R104	ERJ6GEYJ223V	22K 1/10
R105	ERJ6GEYJ334	330K 1/10
R107	ERJ6GEYJ473V	47K 1/10
R108	ERJ6GEYJ332V	3.3K 1/10
R109	ERJ6GEYJ822V	8.2K 1/10
R110	ERJ6GEYJ682V	6.8K 1/10
R111	ERJ6GEYJ682V	6.8K 1/10
R112	ERJ6GEYJ822V	8.2K 1/10
R113	ERJ6GEYJ152V	1.5K 1/10
R114	ERJ6GEYJ152V	1.5K 1/10
R115	ERJ6GEYJ102V	1K 1/10
R116	ERJ6GEYJ182V	1.8K 1/10
R117	ERJ6GEYJ182V	1.8K 1/10
R118	ERJ6GEYJ102V	1K 1/10
R119	ERJ6GEYJ471	470 1/10
R120	ERJ6GEYJ120V	12 1/10
R122	ERJ6GEYJ471	470 1/10
R123	ERJ6GEYJ393V	39K 1/10
R141	ERJ6GEYJ102V	1K 1/10
R142	ERJ6GEYJ333V	33K 1/10
R143	ERJ6GEYJ124V	120K 1/10
R144	ERJ6GEYJ333V	33K 1/10
R145	ERJ6GEYJ153	15K 1/10
R146	ERJ6GEYJ122	1.2K 1/10
R147	ERJ6GEYJ682V	6.8K 1/10
R148	ERJ6GEYJ104V	100K 1/10
R149	ERJ6GEYJ152V	1.5K 1/10
R150	ERJ6GEYJ103V	10K 1/10
R151	ERJ6GEYJ101	100 1/10
R152	ERJ6GEYJ153	15K 1/10
R153	ERJ6GEYJ270V	27 1/10
R154	ERJ8GEYJ3R3V	3.3 1/8
R161	ERJ6GEYJ333V	33K 1/10
R162	ERJ6GEYJ222V	2.2K 1/10
R163	ERJ6GEYJ333V	33K 1/10
R164	ERJ6GEYJ153	15K 1/10
R165	ERJ6GEYJ122	1.2K 1/10
R166	ERJ6GEYJ102V	1K 1/10
R167	ERJ6GEYJ681V	680 1/10
R168	ERJ6GEYJ272V	2.7K 1/10
R169	ERJ6GEYJ392V	3.9K 1/10
R170	ERJ6GEYJ101	100 1/10
R171	ERJ6GEYJ270V	27 1/10
R172	ERJ8GEYJ3R3V	3.3 1/8
R180	ERJ6GEYJ474	470K 1/10
R181	ERJ6GEYJ471	470 1/10
R182	ERJ6GEYJ564V	560K 1/10
R183	ERJ6GEYJ564V	560K 1/10
R184	ERJ6GEYJ223V	22K 1/10
R185	ERJ6GEYJ473V	47K 1/10
R186	ERJ6GEYJ473V	47K 1/10
R187	ERJ6GEYJ473V	47K 1/10
R188	ERJ6GEYJ473V	47K 1/10
R189	ERJ6GEYJ123	12K 1/10
R190	ERJ6GEYJ123	12K 1/10
R191	ERJ6GEYJ154V	150K 1/10
R192	ERJ6GEYJ824V	820K 1/10
R193	ERJ6GEYJ101	100 1/10
R194	ERJ6GEYJ683	68K 1/10
R195	ERJ6GEYJ103V	10K 1/10
R196	ERJ6GEYJ103V	10K 1/10
R197	ERJ6GEYJ473V	47K 1/10
R198	ERJ6GEYJ393V	39K 1/10
R199	ERJ6GEYJ473V	47K 1/10
R201	ERJ6GEYJ102V	1K 1/10
R202	ERJ6GEYJ103V	10K 1/10
R203	ERJ6GEYJ102V	1K 1/10
R204	ERJ6GEYJ682V	6.8K 1/10
R205	ERJ6GEYJ682V	6.8K 1/10
R207	ERJ6GEYJ474	470K 1/10
R208	ERJ6GEYJ680V	68 1/10
R214	ERJ6GEYJ471	470 1/10
R217	ERJ6GEYJ331	330 1/10
R218	ERJ6GEYJ101	100 1/10
R219	ERJ6GEYJ103V	10K 1/10
R230	ERJ6GEYJ223V	22K 1/10
R231	ERJ6GEYJ273V	27K 1/10
R232	ERJ6GEYJ681V	680 1/10
R233	ERJ6GEYJ471	470 1/10
R301	ERDS2TJ472	4.7K 1/4
R302	ERDS2TJ472	4.7K 1/4
R303	ERDS2TJ472	4.7K 1/4
R304	ERDS2TJ472	4.7K 1/4
R305	ERDS2TJ472	4.7K 1/4
R307	ERDS2TJ104	100K 1/4
R308	ERDS2TJ471	470 1/4
R309	ERDS2TJ472	4.7K 1/4
R310	ERDS2TJ222	2.2K 1/4
R311	ERDS2TJ472	4.7K 1/4
R312	ERDS2TJ100	10 1/4
R313	ERDS2TJ100	10 1/4
R314	ERDS2TJ182	1.8K 1/4
R351	ERDS2TJ103	10K 1/4
R352	ERDS2TJ334	330K 1/4
R353	ERDS2TJ123	12K 1/4
R354	ERDS2TJ274	270K 1/4
R355	ERDS2TJ333	33K 1/4
R356	ERDS2TJ333	33K 1/4
R357	ERDS2TJ8R2	8.2 1/4
R401	ERDS2TJ221	220 1/4
R402	ERDS2TJ221	220 1/4
R403	ERDS2TJ221	220 1/4
R404	ERDS2TJ221	220 1/4
R405	ERDS2TJ221	220 1/4
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ221	220 1/4
R408	ERDS2TJ221	220 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ472	4.7K 1/4
R416	ERDS2TJ472	4.7K 1/4
R417	ERDS2T	
R418	ERDS2T	
R419	ERDS2T	
R420	ERDS2T	
R421	ERDS2T	
R422	ERDS2T	
R423	ERDS2T	
R424	ERDS2T	
R425	ERDS2T	
R426	ERDS2T	
R428	ERDS2T	
R429	ERDS2T	
R431	ERDS2T	
R432	ERDS2T	
R433	ERDS2T	
R434	ERDS2T	
R435	ERDS2T	
R501	ERJ6GE	
R502	ERJ6GE	
R503	ERJ6GE	
R504	ERJ6GE	
R505	ERJ6GE	
R506	ERJ6GE	
R507	ERJ6GE	
R601	ERDS2T	
R602	ERDS2T	
R603	ERDS2T	
R604	ERDS2T	
R605	ERDS2T	
R606	ERDS2T	
R607	ERDS2T	
R608	ERDS2T	
R609	ERDS2T	
R610	ERDS2T	
R801	ERDS2T	
R802	ERDS2T	
R803	ERDS2T	
R804	ERDS2T	
R805	ERDS2T	
R806	ERDS2T	
R807	ERDS2T	
R808	ERDS2T	
R809	ERDS2T	
R810	ERDS2T	
R811	ERDS2T	
R812	ERDS2T	
R813	ERDS2T	
R814	ERDS2T	
R815	ERDS2T	
R816	ERDS2T	
R817	ERDS2T	
R818	ERDS2T	
R819	ERDS2T	
R820	ERDS2T	
R821	ERDS2T	
R822	ERDS2T	
R823	ERDS2T	
R831	ERDS2T	
R839	ERDS2T	
R840	ERDS2T	
R841	ERDS2T	
R842	ERDS2T	
R843	ERDS2T	
R851	ERDS2T	
R852	ERDS2T	
R853	ERDS2T	
R854	ERDS2T	
R855	ERDS2T	
R856	ERDS2T	
R857	ERDS2T	

■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

- Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
- Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : -80 % ~20
ECQM	: Poyester	50 : 50V	05 : 50V	
ECQP	: Polypropylene	2H : 500V	2A : 100V	J : ±5%
ECG	: Ceramic	1 : 100V	1J : 63V	G : ±2%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		F : ±1%
QCU	: Ceramic (Chip Type)	KC : 125V AC		C : ±0.25pF
ECUX	: Ceramic (Chip Type)	(UL)		D : ±0.5pF
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R11	ERDS2TJ101	100 1/4
R12	ERDS2TJ331	330 1/4
R13	ERDS2TJ103	10K 1/4
R14	ERDS2TJ103	10K 1/4
R16	ERDS2TJ102	1K 1/4
R25	ERDS2TJ471	470 1/4
R101	ERJ6GEYJ154V	150K 1/10
R102	ERJ6GEYJ472V	4.7K 1/10
R103	ERJ6GEYJ472V	4.7K 1/10
R104	ERJ6GEYJ223V	22K 1/10
R105	ERJ6GEYJ334	330K 1/10
R107	ERJ6GEYJ473V	47K 1/10
R108	ERJ6GEYJ332V	3.3K 1/10
R109	ERJ6GEYJ822V	8.2K 1/10
R110	ERJ6GEYJ682V	6.8K 1/10
R111	ERJ6GEYJ682V	6.8K 1/10
R112	ERJ6GEYJ822V	8.2K 1/10
R113	ERJ6GEYJ152V	1.5K 1/10
R114	ERJ6GEYJ152V	1.5K 1/10
R115	ERJ6GEYJ102V	1K 1/10
R116	ERJ6GEYJ182V	1.8K 1/10
R117	ERJ6GEYJ182V	1.8K 1/10
R118	ERJ6GEYJ102V	1K 1/10
R119	ERJ6GEYJ471	470 1/10
R120	ERJ6GEYJ120V	12 1/10
R122	ERJ6GEYJ471	470 1/10
R123	ERJ6GEYJ393V	39K 1/10
R141	ERJ6GEYJ102V	1K 1/10
R142	ERJ6GEYJ333V	33K 1/10
R143	ERJ6GEYJ124V	120K 1/10
R144	ERJ6GEYJ333V	33K 1/10
R145	ERJ6GEYJ153	15K 1/10
R146	ERJ6GEYJ122	1.2K 1/10
R147	ERJ6GEYJ682V	6.8K 1/10
R148	ERJ6GEYJ104V	100K 1/10
R149	ERJ6GEYJ152V	1.5K 1/10
R150	ERJ6GEYJ103V	10K 1/10
R151	ERJ6GEYJ101	100 1/10
R152	ERJ6GEYJ153	15K 1/10
R153	ERJ6GEYJ270V	27 1/10
R154	ERJ8GEYJ3R3V	3.3 1/8
R161	ERJ6GEYJ333V	33K 1/10
R162	ERJ6GEYJ222V	2.2K 1/10
R163	ERJ6GEYJ333V	33K 1/10
R164	ERJ6GEYJ153	15K 1/10
R165	ERJ6GEYJ122	1.2K 1/10
R166	ERJ6GEYJ102V	1K 1/10
R167	ERJ6GEYJ681V	680 1/10
R168	ERJ6GEYJ272V	2.7K 1/10
R169	ERJ6GEYJ392V	3.9K 1/10
R170	ERJ6GEYJ101	100 1/10
R171	ERJ6GEYJ270V	27 1/10
R172	ERJ8GEYJ3R3V	3.3 1/8
R180	ERJ6GEYJ474	470K 1/10
R181	ERJ6GEYJ471	470 1/10
R182	ERJ6GEYJ564V	560K 1/10
R183	ERJ6GEYJ564V	560K 1/10
R184	ERJ6GEYJ223V	22K 1/10
R185	ERJ6GEYJ473V	47K 1/10
R186	ERJ6GEYJ473V	47K 1/10
R187	ERJ6GEYJ473V	47K 1/10
R188	ERJ6GEYJ473V	47K 1/10
R189	ERJ6GEYJ123	12K 1/10
R190	ERJ6GEYJ123	12K 1/10
R191	ERJ6GEYJ154V	150K 1/10
R192	ERJ6GEYJ824V	820K 1/10
R193	ERJ6GEYJ101	100 1/10
R194	ERJ6GEYJ683	68K 1/10
R195	ERJ6GEYJ103V	10K 1/10
R196	ERJ6GEYJ103V	10K 1/10
R197	ERJ6GEYJ473V	47K 1/10
R198	ERJ6GEYJ393V	39K 1/10
R199	ERJ6GEYJ473V	47K 1/10
R201	ERJ6GEYJ102V	1K 1/10
R202	ERJ6GEYJ103V	10K 1/10
R203	ERJ6GEYJ102V	1K 1/10
R204	ERJ6GEYJ682V	6.8K 1/10
R205	ERJ6GEYJ682V	6.8K 1/10
R207	ERJ6GEYJ474	470K 1/10
R208	ERJ6GEYJ680V	68 1/10
R214	ERJ6GEYJ471	470 1/10
R217	ERJ6GEYJ331	330 1/10
R218	ERJ6GEYJ101	100 1/10
R219	ERJ6GEYJ103V	10K 1/10
R230	ERJ6GEYJ223V	22K 1/10
R231	ERJ6GEYJ273V	27K 1/10
R232	ERJ6GEYJ681V	680 1/10
R233	ERJ6GEYJ471	470 1/10
R301	ERDS2TJ472	4.7K 1/4
R302	ERDS2TJ472	4.7K 1/4
R303	ERDS2TJ472	4.7K 1/4
R304	ERDS2TJ472	4.7K 1/4
R305	ERDS2TJ472	4.7K 1/4
R307	ERDS2TJ104	100K 1/4
R308	ERDS2TJ471	470 1/4
R309	ERDS2TJ472	4.7K 1/4
R310	ERDS2TJ222	2.2K 1/4
R311	ERDS2TJ472	4.7K 1/4
R312	ERDS2TJ100	10 1/4
R313	ERDS2TJ100	10 1/4
R314	ERDS2TJ182	1.8K 1/4
R351	ERDS2TJ103	10K 1/4
R352	ERDS2TJ334	330K 1/4
R353	ERDS2TJ123	12K 1/4
R354	ERDS2TJ274	270K 1/4
R355	ERDS2TJ333	33K 1/4
R356	ERDS2TJ333	33K 1/4
R357	ERDS2TJ8R2	8.2 1/4
R401	ERDS2TJ221	220 1/4
R402	ERDS2TJ221	220 1/4
R403	ERDS2TJ221	220 1/4
R404	ERDS2TJ221	220 1/4
R405	ERDS2TJ221	220 1/4
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ221	220 1/4
R408	ERDS2TJ221	220 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ472	4.7K 1/4
R416	ERDS2TJ472	4.7K 1/4
R417	ERDS2TJ472	4.7K 1/4
R418	ERDS2TJ472	4.7K 1/4
R419	ERDS2TJ472	4.7K 1/4
R420	ERDS2TJ472	4.7K 1/4
R421	ERDS2TJ913T	91K 1/4
R422	ERDS2TJ913T	91K 1/4
R423	ERDS2TJ124	120K 1/4
R424	ERDS2TJ124	120K 1/4
R425	ERDS2TJ101	100 1/4
R426	ERDS2TJ101	100 1/4
R428	ERDS2TJ103	10K 1/4
R429	ERDS2TJ472	4.7K 1/4
R431	ERDS2TJ472	4.7K 1/4
R432	ERDS2TJ101	100 1/4
R433	ERDS2TJ153	15K 1/4
R434	ERDS2TJ393	39K 1/4
R435	ERDS2TJ102	1K 1/4
R501	ERJ6GEYJ104V	100K 1/10
R502	ERJ6GEYJ562	5.6K 1/10
R503	ERJ6GEYJ474	470K 1/10
R504	ERJ6GEYJ101	100 1/10
R505	ERJ6GEYJ104V	100K 1/10
R506	ERJ6GEYJ333V	33K 1/10
R507	ERJ6GEYJ102V	1K 1/10
R601	ERDS2TJ104	100K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R608	ERDS2TJ472	4.7K 1/4
R609	ERDS2TJ330	33 1/4
R610	ERDS2TJ330	33 1/4
R801	ERDS2TJ103	10K 1/4
R802	ERDS2TJ103	10K 1/4
R803	ERDS2TJ103	10K 1/4
R804	ERDS2TJ103	10K 1/4
R805	ERDS2TJ223	22K 1/4
R806	ERDS2TJ223	22K 1/4
R807	ERDS2TJ223	22K 1/4
R808	ERDS2TJ223	22K 1/4
R809	ERDS2TJ473	47K 1/4
R810	ERDS2TJ473	47K 1/4
R811	ERDS2TJ473	47K 1/4
R812	ERDS2TJ473	47K 1/4
R813	ERDS2TJ221	220 1/4
R814	ERDS2TJ221	220 1/4
R815	ERDS2TJ474	470K 1/4
R816	ERDS2TJ474	470K 1/4
R817	ERDS2TJ104	100K 1/4
R818	ERDS2TJ104	100K 1/4
R819	ERDS2TJ681	680 1/4
R820	ERDS2TJ681	680 1/4
R821	ERDS2TJ473	47K 1/4
R822	ERDS2TJ473	47K 1/4
R823	ERDS2TJ331	330 1/4
R831	ERDS2TJ472	4.7K 1/4
R839	ERDS2TJ121	120 1/4
R840	ERDS2TJ121	120 1/4
R841	ERDS2TJ105	1M 1/4
R842	ERDS2TJ105	1M 1/4
R843	ERDS2TJ331	330 1/4
R851	ERDS2TJ102	1K 1/4
R852	ERDS2TJ471	470 1/4
R853	ERDS2TJ333	33K 1/4
R854	ERDS2TJ183	18K 1/4
R855	ERDS2TJ102	1K 1/4
R856	ERDS2TJ102	1K 1/4
R857	ERDS2TJ102	1K 1/4
R858	ERDS2TJ102	1K 1/4
R862	ERDS2TJ102	1K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1	ECKDKC103PFZ	0.01
C10	ECEA1CU222	2200 16
C11	ECEA1CU222	2200 16
C12	ECEA1VU101	100 35
C13	ECEA1AU101	100 10
C14	ECEA1AU101	100 10
C15	ECEA0JU470	47 6.3
C16	ECEA1CU331	330 16
C17	ECEA1CU331	330 16
C18	ECEA1VU101	100 35
C19	ECBT1C103NS5	0.01 16
C20	ECEA1CU221	220 16
C30	ECKD1H101KB	100P 50
C31	ECBT1C103NS5	0.01 16
C32	ECBT1C103NS5	0.01 16
C101	RCUV1E104ZF	0.1 25
C102	RCUV1H102KB	0.001 50
C103	RCUV1H102KB	0.001 50
C104	RCUV1H681K	680P 50
C105	RCUV1H471KB	470P 50
C106	RCUV1H471KB	470P 50
C107	RCUV1H220KC	22P 50
C108	ECEA1HKK0R1	0.1 50
C109	ECEA1HKK010	1 50
C110	ECQV1H104JZ	0.1 50
C111	ECEA1AKK100	10 10
C112	ECEA1AKK100	10 10
C113	ECEA1HSN010	1 50
C114	RCUV1H182KB	0.0018 50
C115	RCUV1H682KB	0.0068 50
C116	RCUV1E333KB	0.033 25
C117	RCUV1H221KB	220P 50
C118	ECEA1HKK010	1 50
C119	ECEA0JKS220	22 6.3
C120	RCUV1H681K	680P 50
C121	RCUV1E103KB	0.01 25
C122	RCUV1H101KC	100P 50
C123	RCUV1H101KC	100P 50
C125	ECEA0JKS220	22 6.3
C126	ECEA0JKS470	47 6.3
C127	RCUV1H102KB	0.001 50
C128	RCUV1H102KB	0.001 50
C129	RCUV1H681K	680P 50
C141	RCUV1E153KB	0.015 25
C142	RCUV1H122KB	0.0012 50
C143	ECUV1E473KB	0.047 25
C144	ECEA1VSN2R2	2.2 35
C145	ECEA1HSNR22	0.22 50
C161	RCUV1E153KB	0.015 25
C162	RCUV1H681K	680P 50
C163	RCUV1E103KB	0.01 25
C164	ECEA1ESN3R3	3.3 25
C165	ECEA1HSN0R1	0.1 50
C181	ECQM1H474JZ	0.47 50
C182	RCUV1H221KB	220P 50
C183	RCUV1H682KB	0.0068 50
C184	ECEA1HSN010	1 50
C186	ECUV1C224KR	0.22 16
C201	RCUV1E103KB	0.01 25
C221	ECEA0JKS101	100 6.3
C222	ECEA0JKA101B	100 6.3
C223	ECEA0JKA101B	100 6.3
C224	RCUV1E104ZF	0.1 25
C226	RCUV1E104ZF	0.1 25
C227	RCUV1E104ZF	0.1 25
C228	ECUV1E823KB	0.082 25
C230	ECUV1E473KB	0.047 25
C301	ECFR1E104ZF5	0.1 25
C303	ECFR1E104ZF5	0.1 25
C306	ECEA0JS331	330 6.3
C307	ECFR1E104ZF5	0.1 25
C308	ECFR1E104ZF5	0.1 25
C309	ECBT1C103NS5	0.01 16
C351	ECBT1H102KB5	0.001 50
C401	ECEA0JU470	47 6.3
C402	ECFR1E104ZF5	0.1 25
C403	ECFR1E104ZF5	0.1 25
C404	ECFR1E104ZF5	0.1 25
C404	ECFTD103KXL	0.01 25
C405	ECBT1H102KB5	0.001 50
C406	ECBT1H102KB5	0.001 50
C407	ECEA1HN010	1 50
C409	ECBT1C103NS5	0.01 16
C414	ECBT1C103NS5	0.01 16
C416	ECBT1C103NS5	0.01 16
C501	ECUV1E104KB	0.1 25
C502	ECQV1H104JZ	0.1 50
C503	ECEA1AKK100	10 10
C504	RCUV1E104ZF	0.1 25
C505	RCUV1E104ZF	0.1 25
C506	RCUV1H150K	15P 50
C507	RCUV1H102KB	0.001 50
C508	ECEA1ASN100	10 10
C509	RCUV1H100DC	10P 50
C510	ECUV1E104KB	0.1 25
C511	ECEA1HKSR47	0.47 50
C512	RCUV1H681K	680P 50
C513	RCUV1H681K	680P 50
C514	ECUV1C224KR	0.22 16
C515	RCUV1E153KB	0.015 25
C516	ECEA1VSN2R2	2.2 35
C517	RCUV1H471KB	470P 50
C519	ECUV1C224KR	0.22 16
C520	RCUV1H472KB	0.0047 50
C601	RCBC1H101KBY	100P 50
C602	RCBC1H101KBY	100P 50
C603	RCBC1H101KBY	100P 50
C604	RCBC1H101KBY	100P 50
C801	ECBT1H680K5	68P 50
C802	ECBT1H680K5	68P 50
C803	ECBT1H680K5	68P 50
C804	ECBT1H680K5	68P 50
C805	ECBT1H470J5	47P 50
C806	ECBT1H470J5	47P 50
C807	ECBT1H470J5	47P 50
C808	ECBT1H470J5	47P 50
C809	ECEA1EN3R3S	3.3 25
C810	ECEA1EN3R3S	3.3 25
C811	ECBT1H102KB5	0.001 50
C812	ECBT1H102KB5	0.001 50
C813	ECEA1CN220S	22 16
C814	ECEA1CN220S	22 16
C815	ECBT1H102KB5	0.001 50
C816	ECBT1H102KB5	0.001 50
C822	ECBT1H5R6K5	5.6P 50
C824	ECBT1H5R6K5	5.6P 50
C840	ECFR1E104ZF5	0.1 25
C841	ECEA0JS331	330 6.3
C851	ECEA0JU471	470 6.3
C852	ECEA0JS331	330 6.3
C853	ECEA1CN100S	10 16
C854	ECFR1E104ZF5	0.1 25
C855	ECFR1E104ZF5	0.1 25
C856	ECFR1E104ZF5	0.1 25
C857	ECFR1E104ZF5	0.1 25
C858	ECFR1E104ZF5	0.1 25
C859	ECEA0JS331	330 6.3
C859	ECFR1E104ZF5	0.1 25
C863	ECEA1HU3R3	3.3 50

DIGITAL SIGNAL PROCESSING

IC301

Synchro-nize det.
Frequency detector
Synchronize protection
EFM decoder
PCK timing
Sub-code decoder
Syndrome
CCU
Working RAF
ALU
Compe-nsation
Address generator
Process-ing
MCK timing
Track counter
CPU interfaces
Rough servo
Severe servo
CLV control

(FPC) (SRF) (EFM) (PCK) (FPC) (DO) (SLC/TRON) (FLOCK) (SENSE) (FO ON/CNT1) (TR ON/CNT2) (KICKF/CNT3) (KICK R/CNT4) (KICK F/R) (H OUT)

(WDCK) (CLDCK) (BLKCK) (SUBQ) (SRF) (PC) (EC) (LR) (SRDATA) (SRCK) (DMUTE) (WE) (OE) (RST) (STAT) (MDATA) (MCLK) (MLD) (SMCK) (TRON) (DO)

+B

16KRAM

IC302

Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable

(OE) (WE)

DIGITAL FILTER & D/A CONVERTER

IC801

ROM
Logic
Accumulator
MASH
S/P
DATA RAM L, R
PWM 768fs
PWM 768fs
PWM 32fs
Microcomputer interface
Timing generator
X801

(MDATA) (MCLK) (MLD) (384FS)

IC803(L2) Comparator
IC804(L2) Comparator
IC805 L.P.F.
IC806 L.P.F.
IC803(R2) Buffer amp
IC804(R2) Buffer amp
Lch
Rch
LINE OUT
Muting control
Q803,804
Q854,855 Emphasis drive
Q851~853,856 Muting drive

IC104 FE amp
IC106(L2) Q141,142 Focus coil drive
IC106(R2) Q161,162 Tracking coil drive

IC13, Q407 Reset signal generator +B

IC201 Regulator 5V Optical pickup IC101,501
Regulator IC202
Regulator −5V IC101,501
Q201

Motor control IC402, Q351
Motor drive Q403,404
SPINDLE MOTOR

(CNT4) (CNT3) (TRON) (CNT1) (FLOCK) (SENSE) (MLD) (MCLK) (MDAT4) (STAT) (OSC1) (OSC2) (DMUTE) (EMPH) (MUTE) (RST) (OSC2) (OSC1) (RST)

IC401
SYSTEM CONTROL & FL DRIVE

(BLKCK) (CLDCK) (SUBQ) (RECV) (SEND) (ACK) (CLK) DATA0 DATA3

IC601
FL DRIVE & KEY MATRIX CONTROL

KEY MATRIX
FL DISPLAY
FL601

Q408,409 Remote control drive
REMOTE CONTROL

Q405,406 SYNCHRO REC DRIVE
SYNCHRO REC CONTROL

TRV Q181,182 Traverse coil drive
IC103 Traverse servo
IC102
SPEED POSITION SENSOR
(TRV-R) (TRV-F)

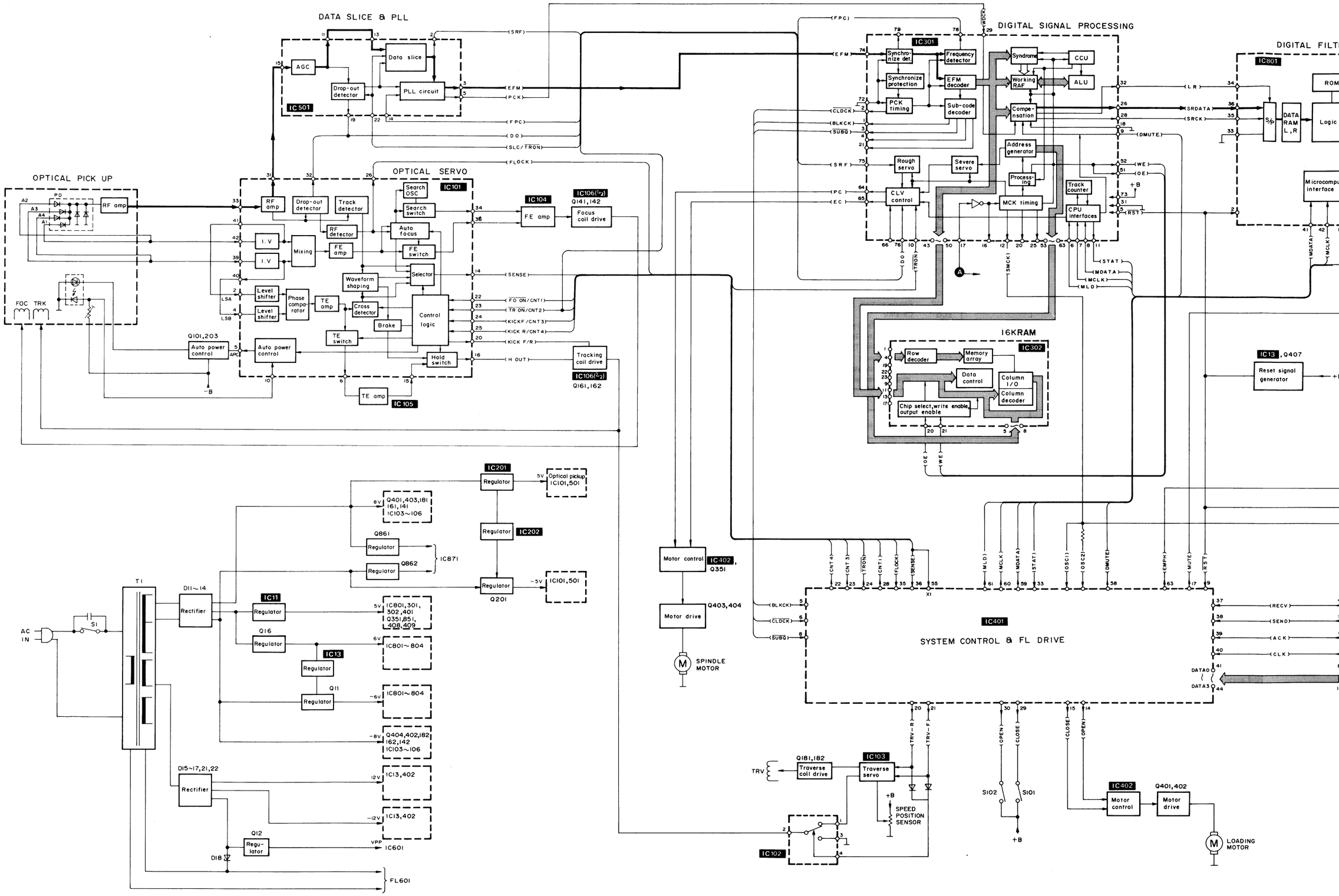
SI02 SI01 (OPEN) (CLOSE) (CLOSE) (OPEN)

IC402 Motor control
Q401,402 Motor drive
LOADING MOTOR

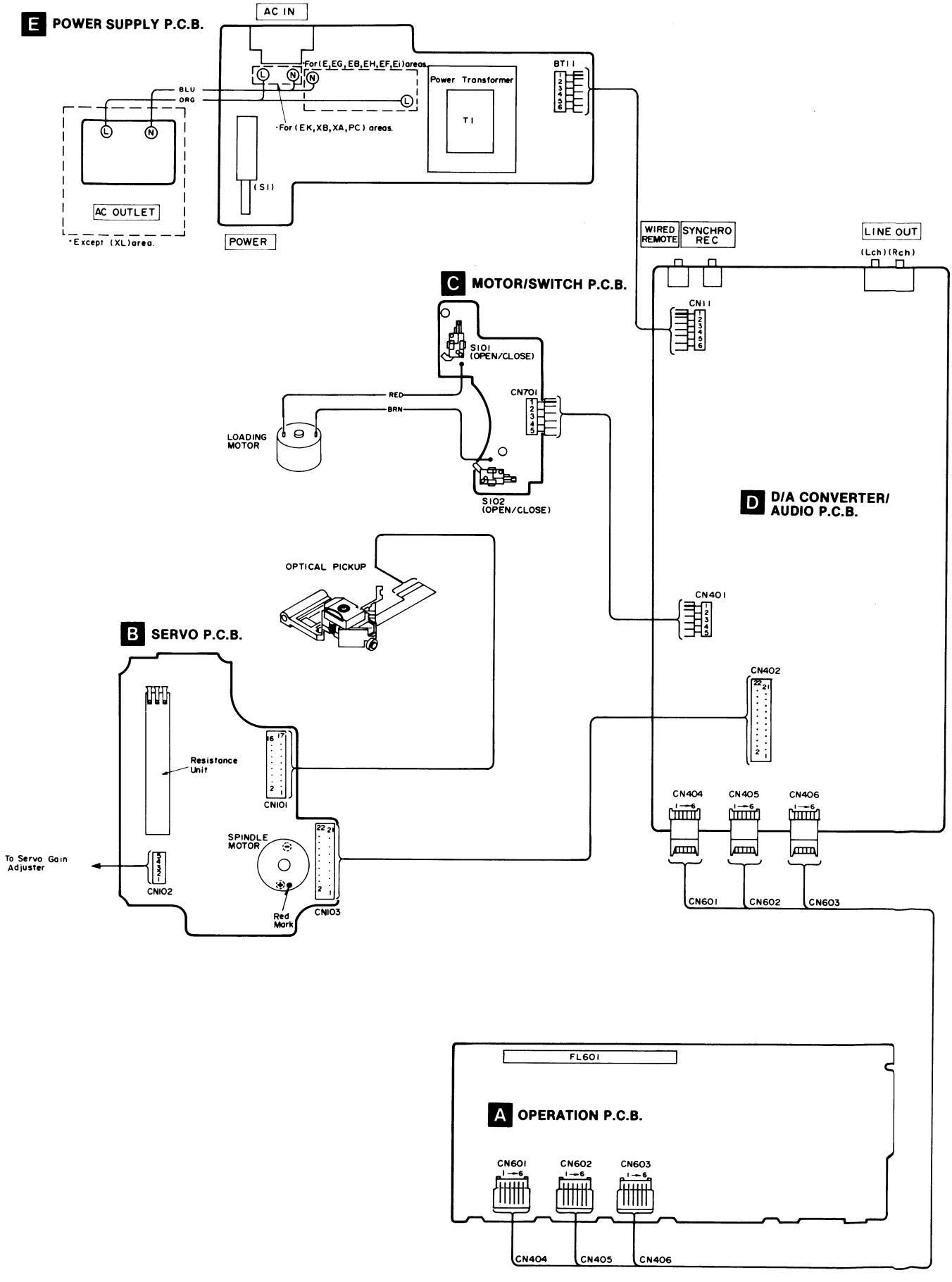
Note)
• ⟶ Audio signal

SL-PJ25 SL-PJ25

■ BLOCK DIAGRAM



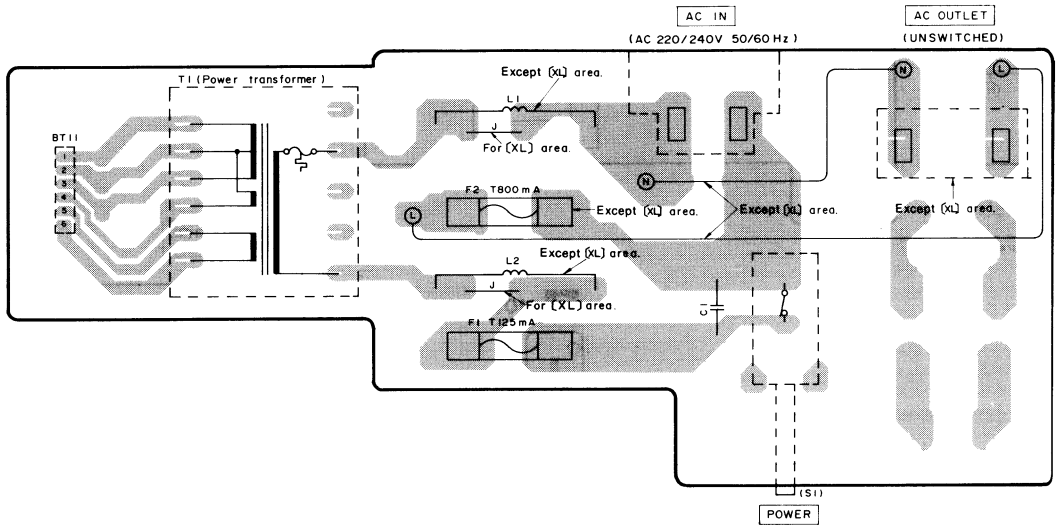
■ WIRING CONNECTION DIAGRAM



■ PRINTED CIRCUIT BOARDS

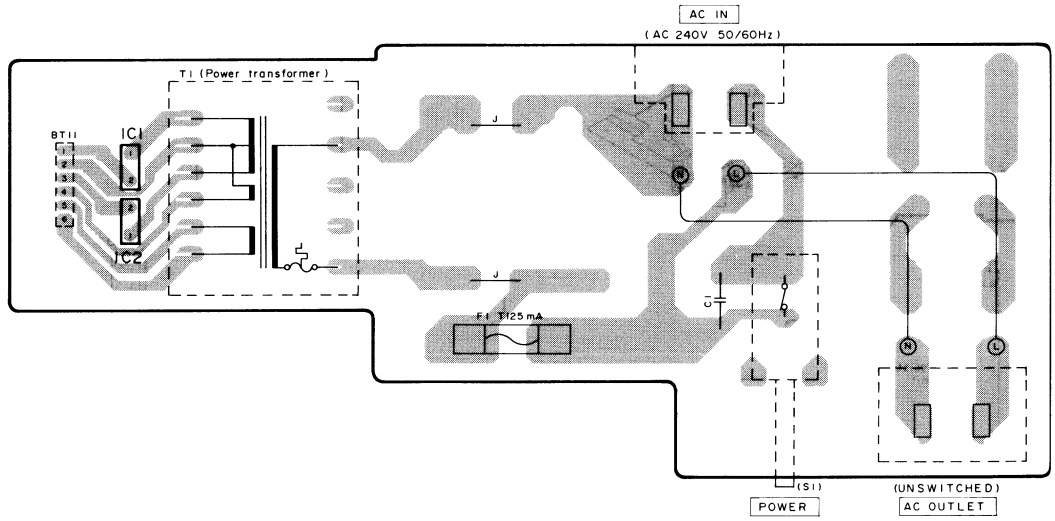
E POWER SUPPLY P.C.B.

• For (E), (EG), (EB), (EH), (EF), (Ei) and (XL) areas.



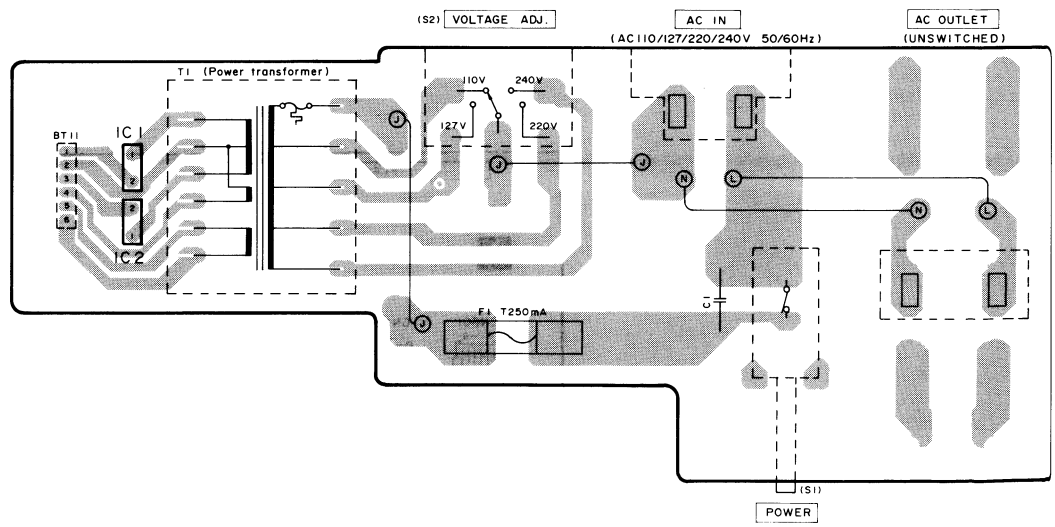
E POWER SUPPLY P.C.B.

• For (EK) area.

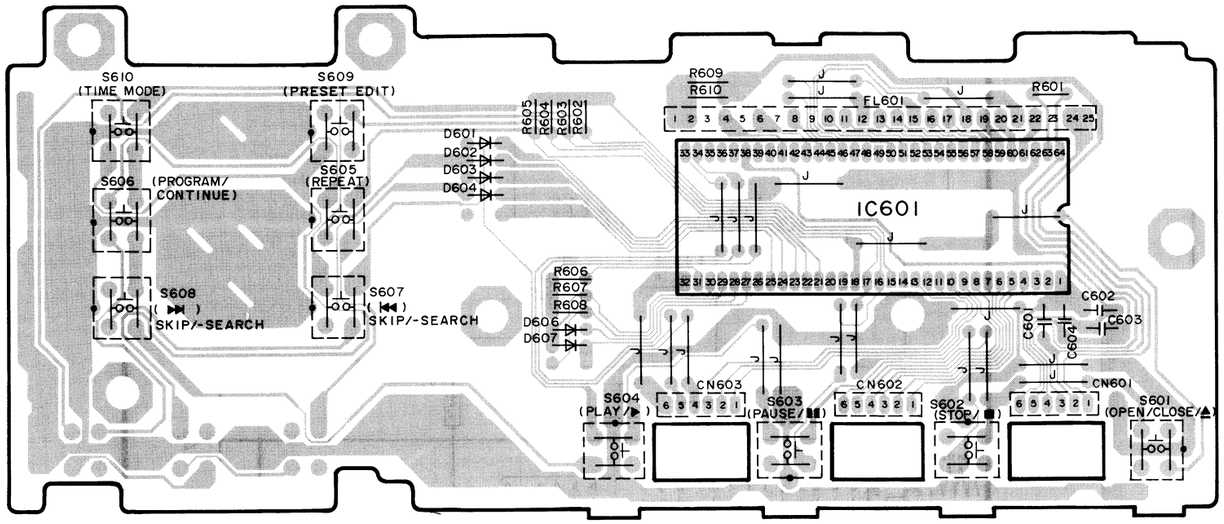


E POWER SUPPLY P.C.B.

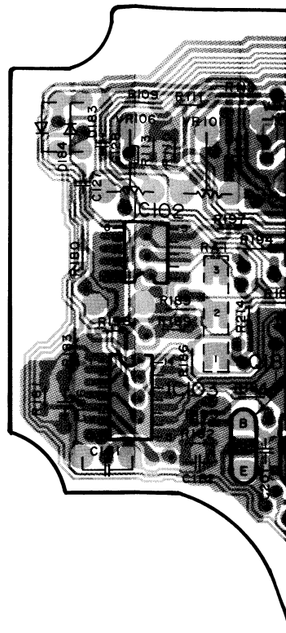
• For (XA), (XB) and (PC) areas.



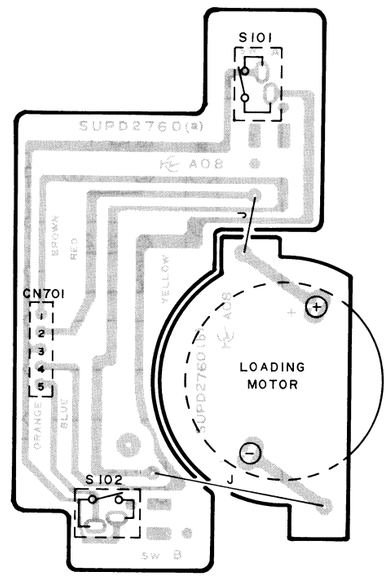
A OPERATION P.C.B.



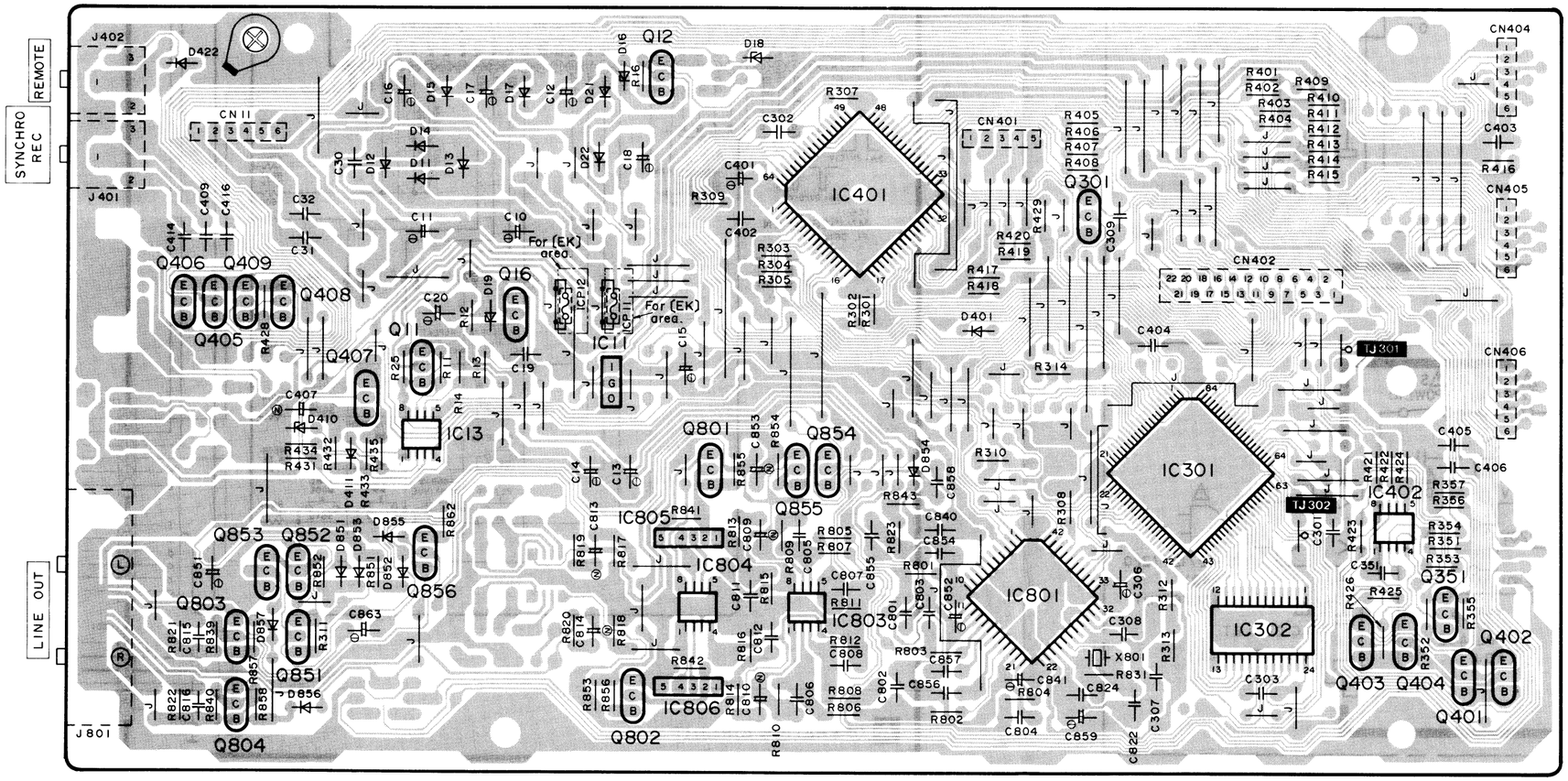
B SERVO P.C.B.



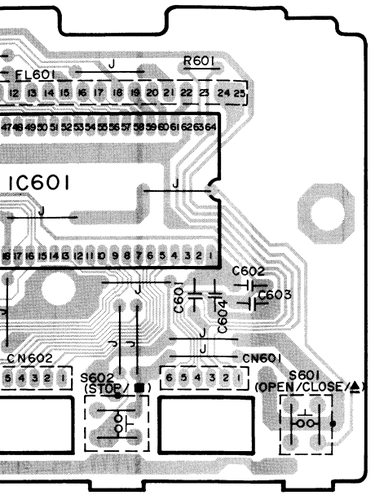
C MOTOR/SWITCH P.C.B.

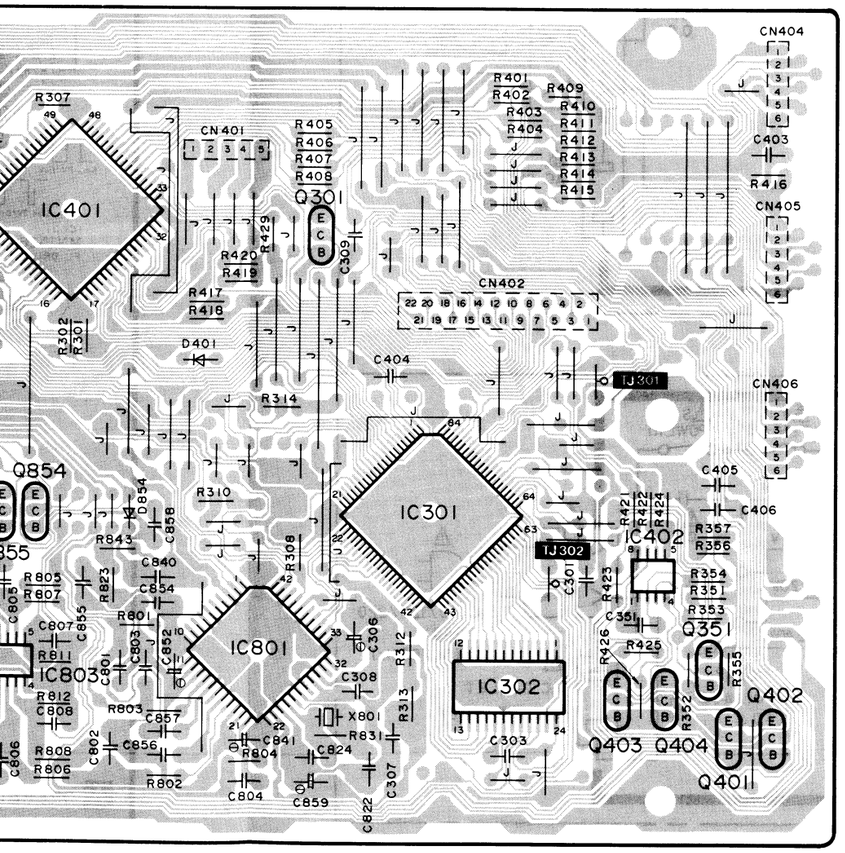


D D/A CONVERTER/AUDIO P.C.B.



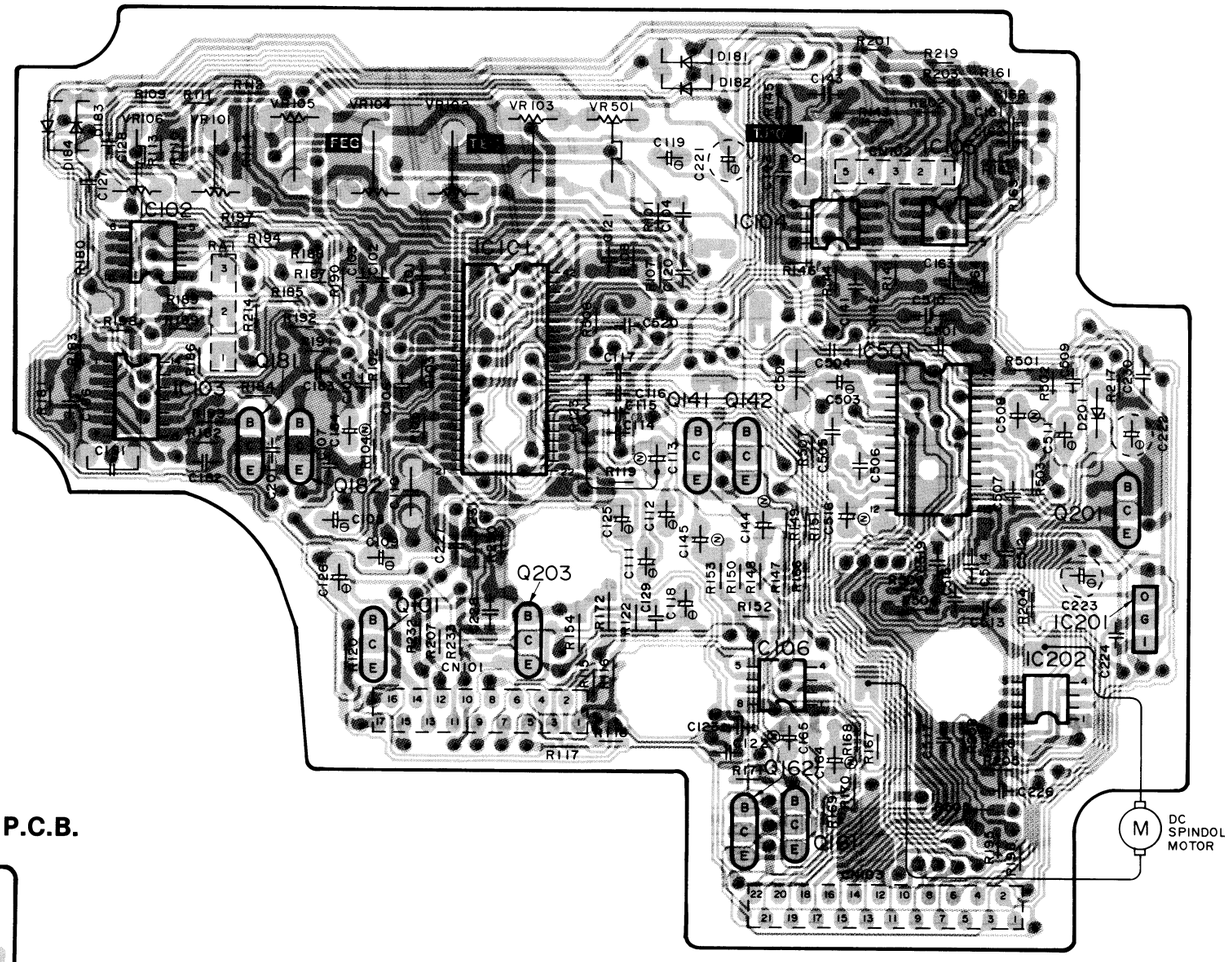
10 11 12 13 14 15 16 17 18 19





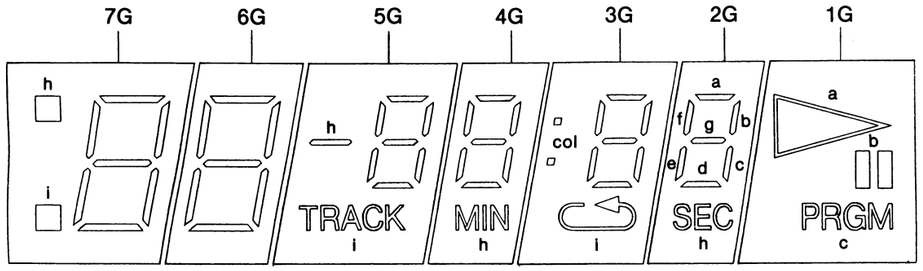
B SERVO P.C.B.

● — ● Circuit view on top of P.C.B.



■ INTERNAL CONNECTION OF FL

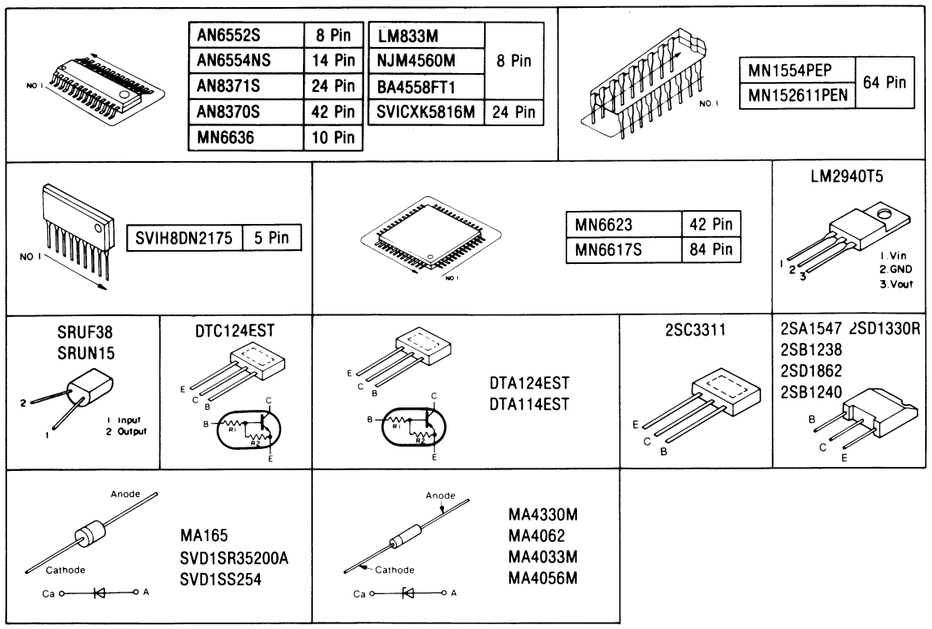
• Grid connection diagram



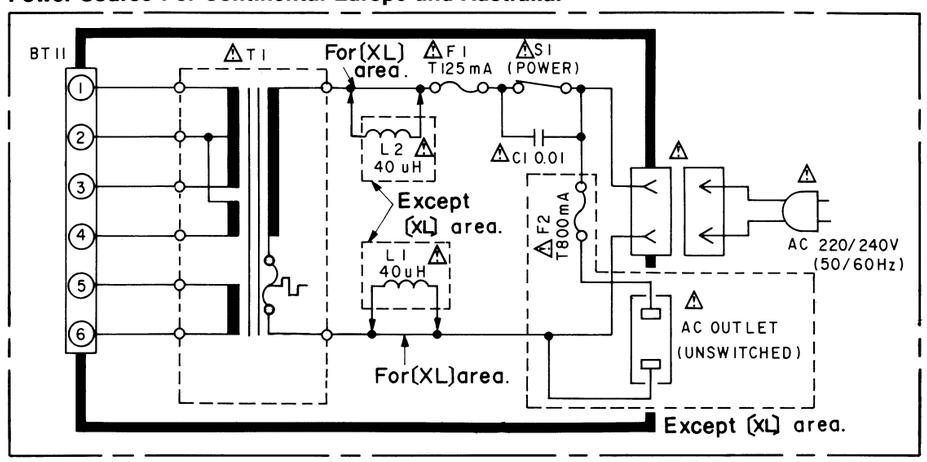
• Anode connection table

	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	▷
b	b	b	b	b	b	b	▮▮
c	c	c	c	c	c	c	PRGM
d	d	d	d	d	d	d	
e	e	e	e	e	e	e	
f	f	f	f	f	f	f	
g	g	g	g	g	g	g	
h	■	–	—	MIN	col	SEC	
i	■	–	TRACK	–	↺	–	

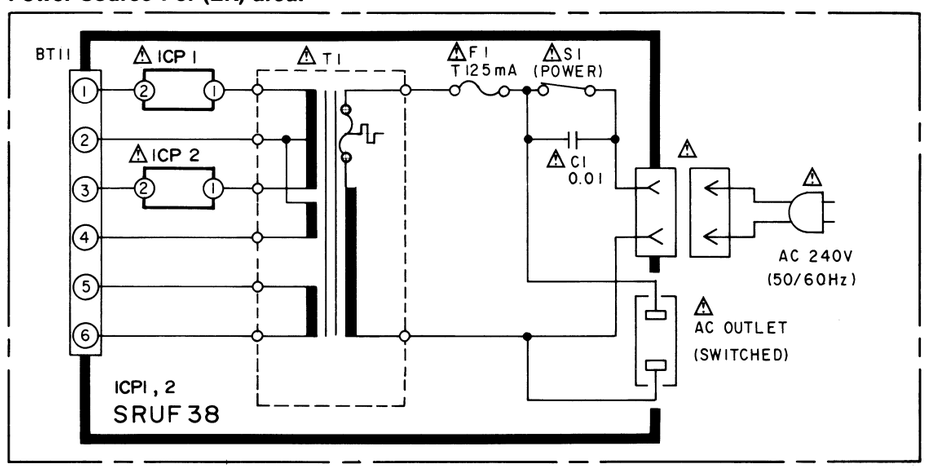
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



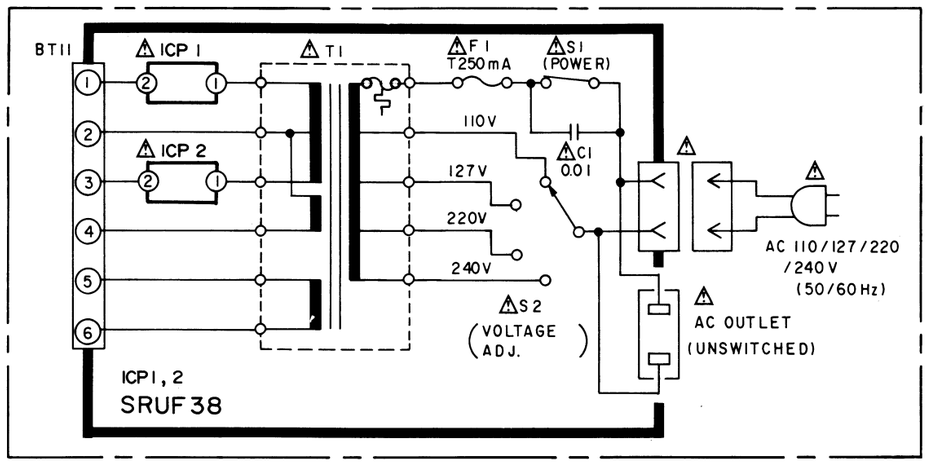
Power Source For Continental Europe and Australia.

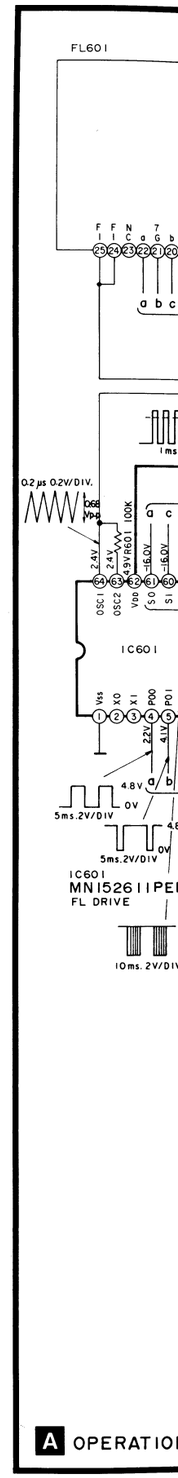


Power Source For (EK) area.

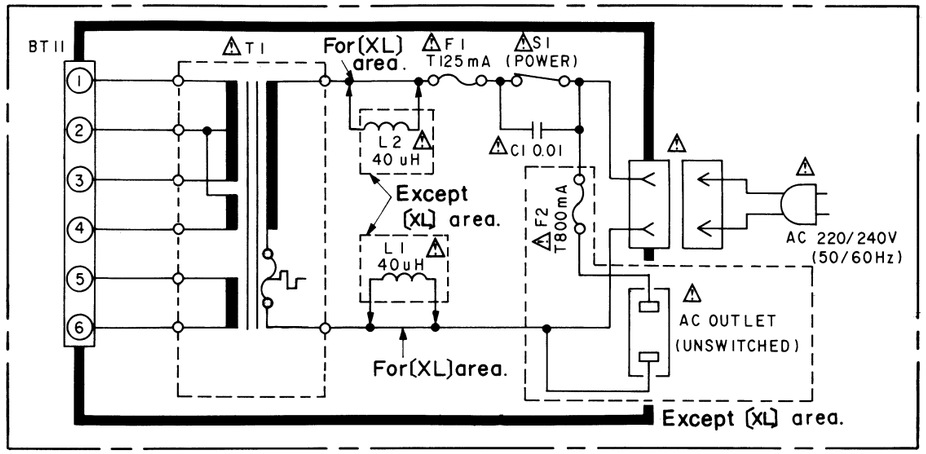


Power Source For Others.

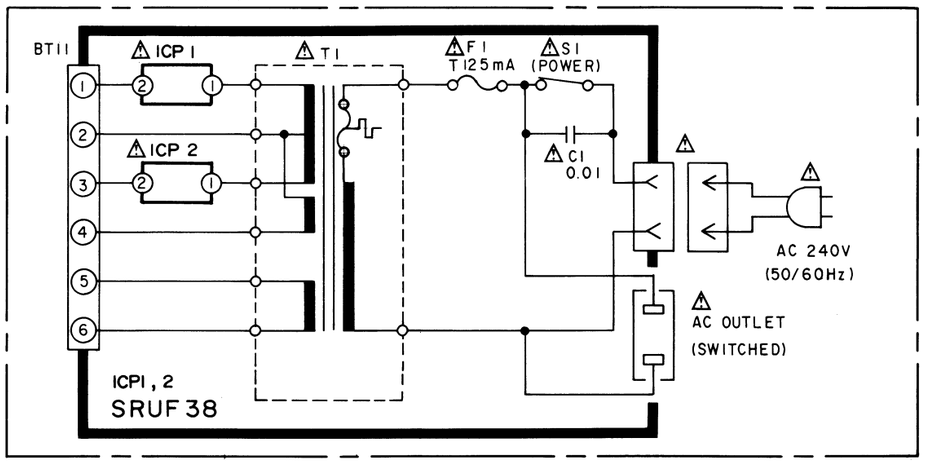




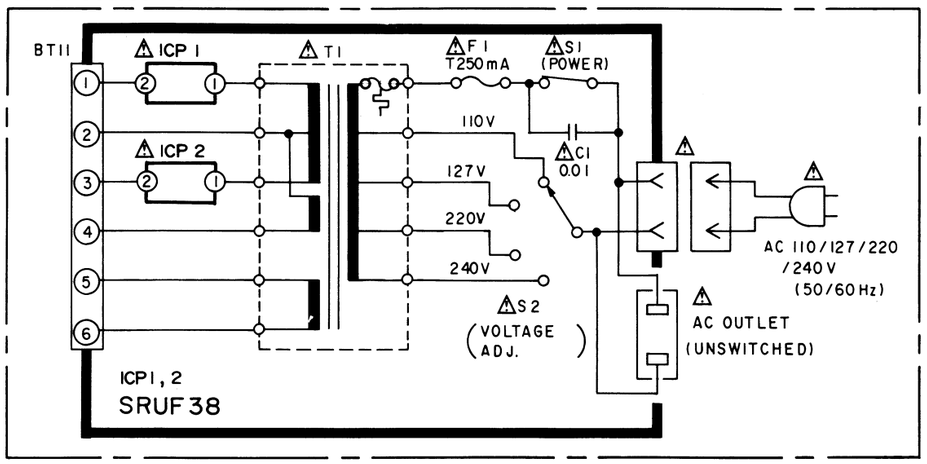
Power Source For Continental Europe and Australia.

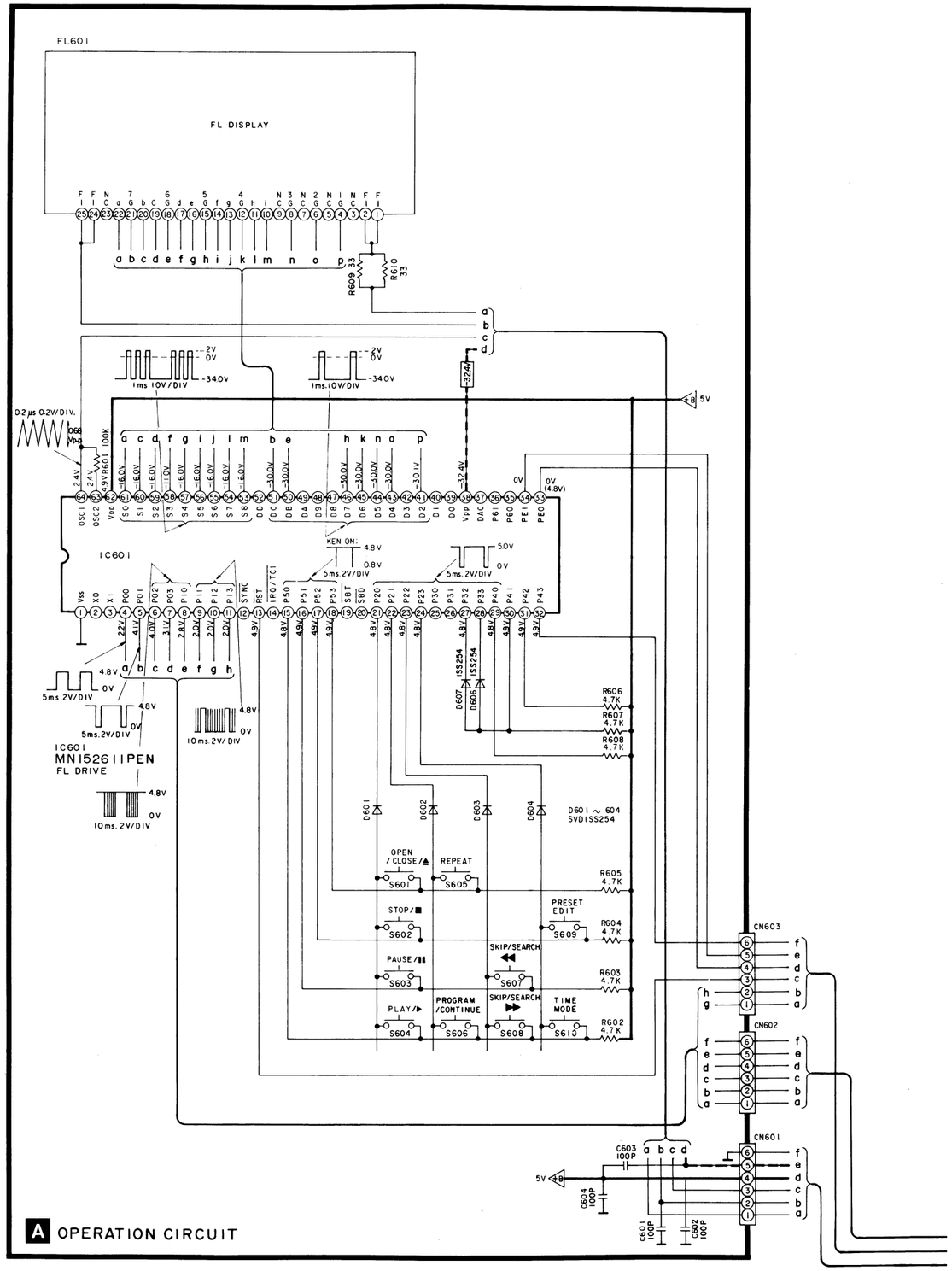


Power Source For (EK) area.



Power Source For Others.





B SERVO CIRCUIT

OPTICAL PICKUP

OPTICAL PICKUP

RAI SPEED POSITION SENSOR

CN101

TRV FOC TRK A1 A3 A4 A2 GND RF Vcc

CN102

Play 0.5μs.0.1V/DIV 0.3Vp-p

Best eye adj.

Tracking balance adj.

IC101 AN8370S OPTICAL SERVO

Q203 2SD1862 A.P.C

Q101 2SA1547 A.P.C

Tracking offset adj.

IC104, 106 SVIBA4558FT FOCUS COIL/ TRACKING COIL DRIVE

Focus offset adj.

IC103 BA10324FTI TRAVERSE SERVO

Focus gain adj.

Tracking gain adj.

PLL adj.

IC501 AN8371S PLL/DATA SLICE

IC105 SVIBA4558FTI FOCUS ERROR AMP

IC201 LM2940T5 REGULATOR

IC202 SVIBA4558FTI REGULATOR

Q201 2SD1862 REGULATOR

Q141,161 2SD1862 FOCUS COIL/ TRACKING COIL DRIVE

Q142,162 2SB1240 FOCUS TRACKING COIL DRIVE

Q181 2SD1862 TRAVERSE COIL DRIVE

IC102 MN6636 SWITCHING

Q182 2SB1240 TRAVERSE COIL DRIVE

TJ101

C MOTOR/ SWITCH CIRCUIT

LOADING MOTOR

SI01 SI02 OPEN/CLOSE DETECTOR

CN701

CN401

SPINDOL MOTOR

D D/A CONVERTER/AUDIO CIRCUIT

Q401 2SD1862 MOTOR DRIVE

Q402 2SB1240 MOTOR DRIVE

IC402 BA4558FTI MOTOR DRIVE

Q301 DTC124ES SWITCHING

TJ302

Q403 2SD1862 MOTOR DRIVE

Q404 2SB1240 MOTOR DRIVE

TJ301

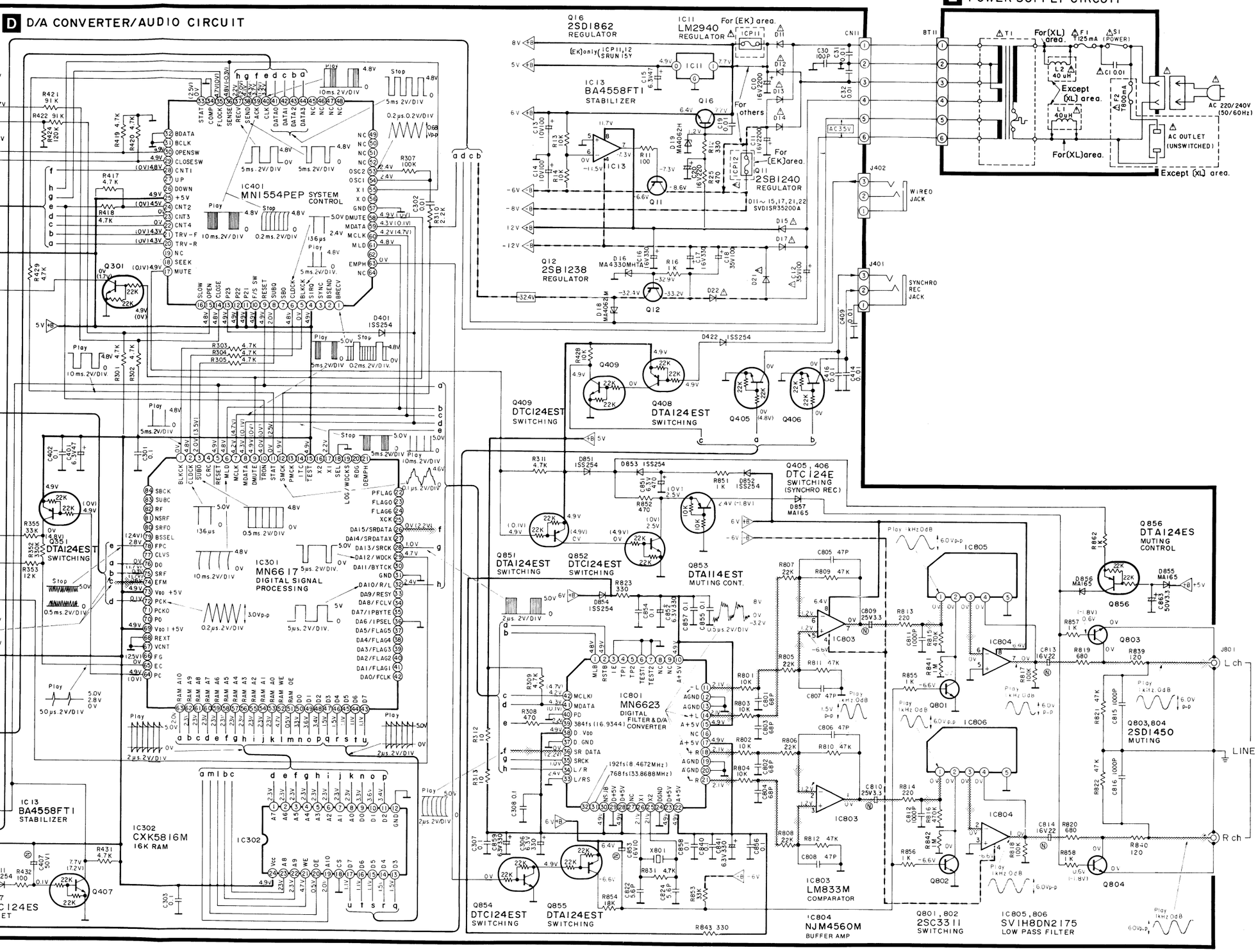
Q351 DTA124EST SWITCHING

IC13 BA4558FTI STABILIZER

IC302 CXK5816M 16K RAM

Q407 DTC124ES RESET

CN103 CN402 CN405 CN406 CN404



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

Notes:

- **S1** : Power switch in "**on**" position.
- **S2** : Voltage selector switch. (For [XA], [XB] and [PC] only.)
- **S101** : Disc holder open/close detection switch.
- **S102** : Disc holder open/close detection switch.
- **S601** : Open/close switch.
- **S602** : Stop switch.
- **S603** : Pause switch.
- **S604** : Play switch.
- **S605** : Repeat switch.
- **S606** : Program switch.
- **S607** : Backward skip/search switch.
- **S608** : Forward skip/search switch.
- **S609** : Preset edit play switch.
- **S610** : Time-mode select switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ——□—— /--□--- : Positive voltage lines and negative voltage lines.
  ——— : Audio signal lines.

Caution !

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

■ REPLACEMENT PARTS LIST (Mechanical parts)

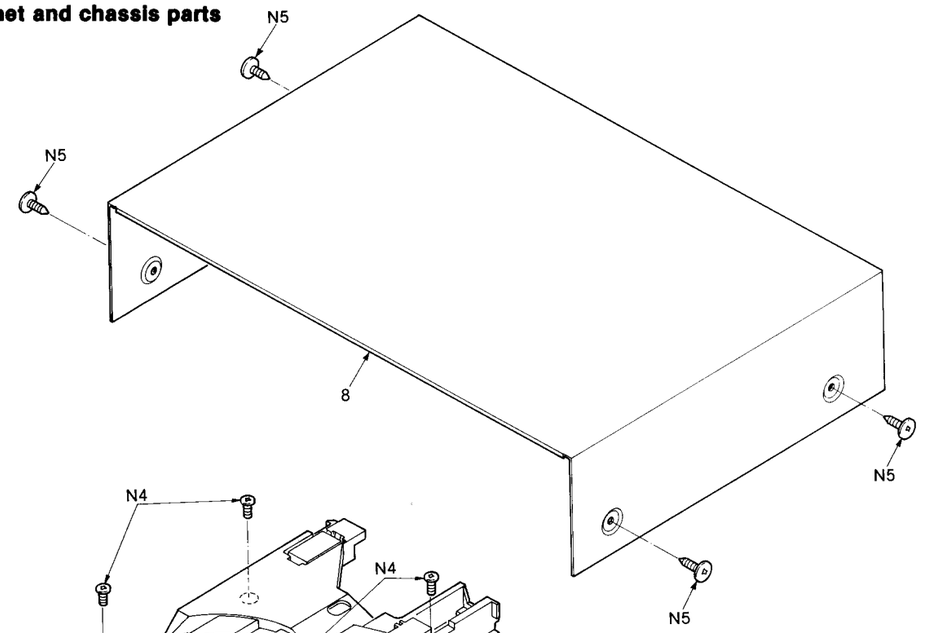
Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

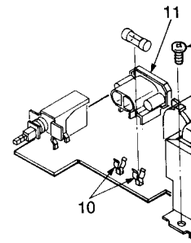
Ref. No.	Part No.	Description
CABINET AND CHASSIS		
1 (EK)	SGPD750ZF6A	REAR PANEL
1 (XL)	SGPD750ZF7A	REAR PANEL
1 (XB)	SGPD750ZF8A	REAR PANEL
1 (XA)	SGPD750ZF9A	REAR PANEL
1 (EB, EH, EF) (EI)	SGPLPJ25-KB	REAR PANEL
1 (EG, E)	SGPLPJ25-KG	REAR PANEL
1 (PC)	SGPLPJ25-KP	REAR PANEL
2	SKL307	FOOT
3	SUSD144	SPRING
4 (EK)	SJS9330A	AC OUTLET COVER
4 (XA, PC)	SJS9332A	AC OUTLET COVER
6	SBC666-1	BUTTON, POWER SW
7	SUBD16	ROD, POWER SW
8	SKCD660KF	CABINET COVER
9	SGYLPJ25-KE	FRONT PANEL ASS'Y
10	SJT347	FUSE HOLDER
11 ⚠ (XL)	SJSD16	AC INLET
11 ⚠ (EG, EH, EB) (EF, EK, EI) (XA, PC, E, XB)	SJS9236	AC INLET
12 ⚠ (E, EG, EB, EH) (EF, EI)	SJS9225	AC OUTLET
12 ⚠ (XA, PC)	SJS9232B	AC OUTLET
12 ⚠ (EK)	SJS9332B	AC OUTLET
14	SJT30640LX-V	CONNECTOR(6P)(CN11)
15	SJT30543-V	CONNECTOR(5P)(CN401)
16	SJSD2221	CONNECTOR(CN402)
17	SJS50680WL	CONNECTOR(6P)(CN404,CN405,CN40
18	SJT30647WL	CONNECTOR(6P)(CN601,CN602,CN60
19	SMND18	DISPLAY HOLDER
SCREWS, WASHERS AND NUTS		
N1	XTB3+8G	SCREW
N2	XTB3+8J	SCREW
N3	XTB3+8JFZ	SCREW
N4	XTB3+8F	SCREW
N5	SNE2129-1	SCREW
N6	XTB3+8G	SCREW

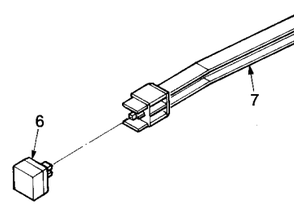
Ref. No.	Part No.	Description
LOADING MECHANICAL		
101	SGXD3130ZK0A	ORNAMENT
102	SISD22-1	TRAVERSE BASE
103	SD0D28-1E	TURNTABLE
103-1	XXE26D5	SCREW
104	SD0D29-2	RING
106	SRQA010N04	SPRING
107	S0RD37	ROLLER
108	S0RD38-E	COIL
109	SUXD123-1	GUIDE SHAFT
110 ⚠	S0AD70A	OPTICAL PICKUP
111	SHRD176-E	COIL HOLDER
112	SNSD35	SCREW
113	SHGD148	STOPPER
114	S0YD21-E	YOKE (A)(A)
115	S0YD22	YOKE (B)(B)
116	SHRD177-1	LOCK UNIT
117	SHWD33	WASHER
118	SHWD34	WASHER
119	SNSD31	SCREW
120	XTV2+5G	SCREW
121	XYN2+C8	SCREW
122	XYN26+J6	SCREW
123	SHGD153-1	CUSHION RUBBER
124	SUSD136-1	SPRING
125	SUSD137-1	SPRING
126	SNSD33	SCREW
127	SIWLP150-KM	LOADING BASE
128	SUSD145-1	SPRING
129	SUWD112	GUIDE SHAFT HOLDER
130	SURD13	ROLLER
131	SDGD58	MAIN GEAR
132	SDGD59-2	GEAR
133	SIRD94-E	LOADING MOTOR
134	XTB3+10G	SCREW
135	SMBD7	BELT
136	SIRD101	LOADINGBASE BRACKET
137	SFUMZ15R61	WASHER
138	SDRD14	ROLLER
139	XTB3+8G	SCREW
140	SIRLP990-KM	DISC HOLDER
141	SIRD99	TRAY BASE
142	SIRD40-2	RACK GEAR
143	SIRD96	LOCK LEVER
144	SFUMZ15R61	WASHER
145	SIRD98-1	DISC TRAY
146	SUSD83	SPRING
147	SFXGQ06N01	SCREW
148	SIWD105	BRACKET
149	SJGDRF310T-2	SPINDLE MOTOR
150	SIRD51	HOLDER
151	SIRD42-2	CLAMPER
152	S0MD4	MAGNET
153	S0YD2	YOKE
154	SIKD150051	FLAT CABLE
155	SIKD150221-1	FLAT CABLE
156	SHRD150	ROLLER HOLDER
157	SJSD1722	CONNECTOR
158	SJSD2222	CONNECTOR(CN103)
159	SJT30543-V	CONNECTOR(5P)
160	SDRD12	ROLLER

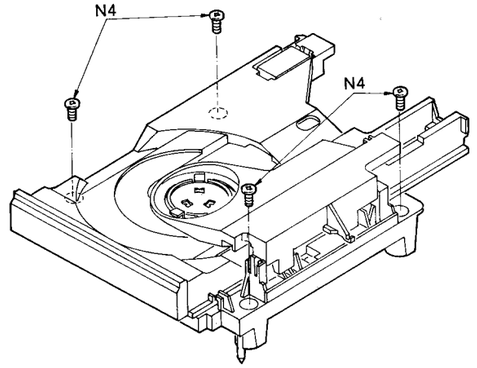
■ EXPLODED VIEWS

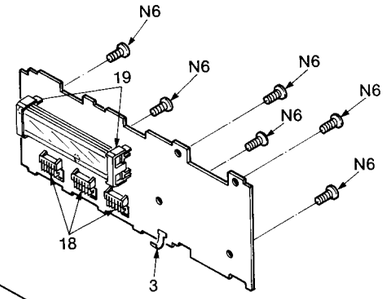
• Cabinet and chassis parts

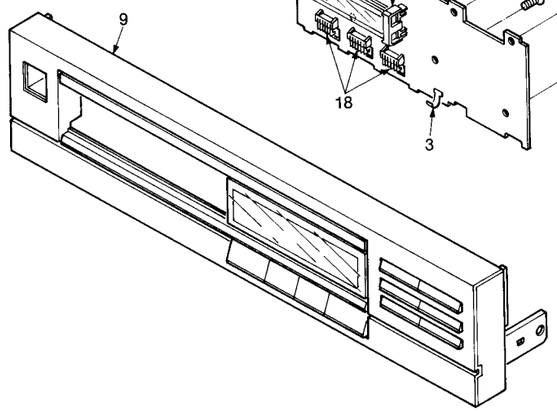


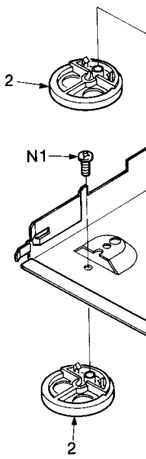




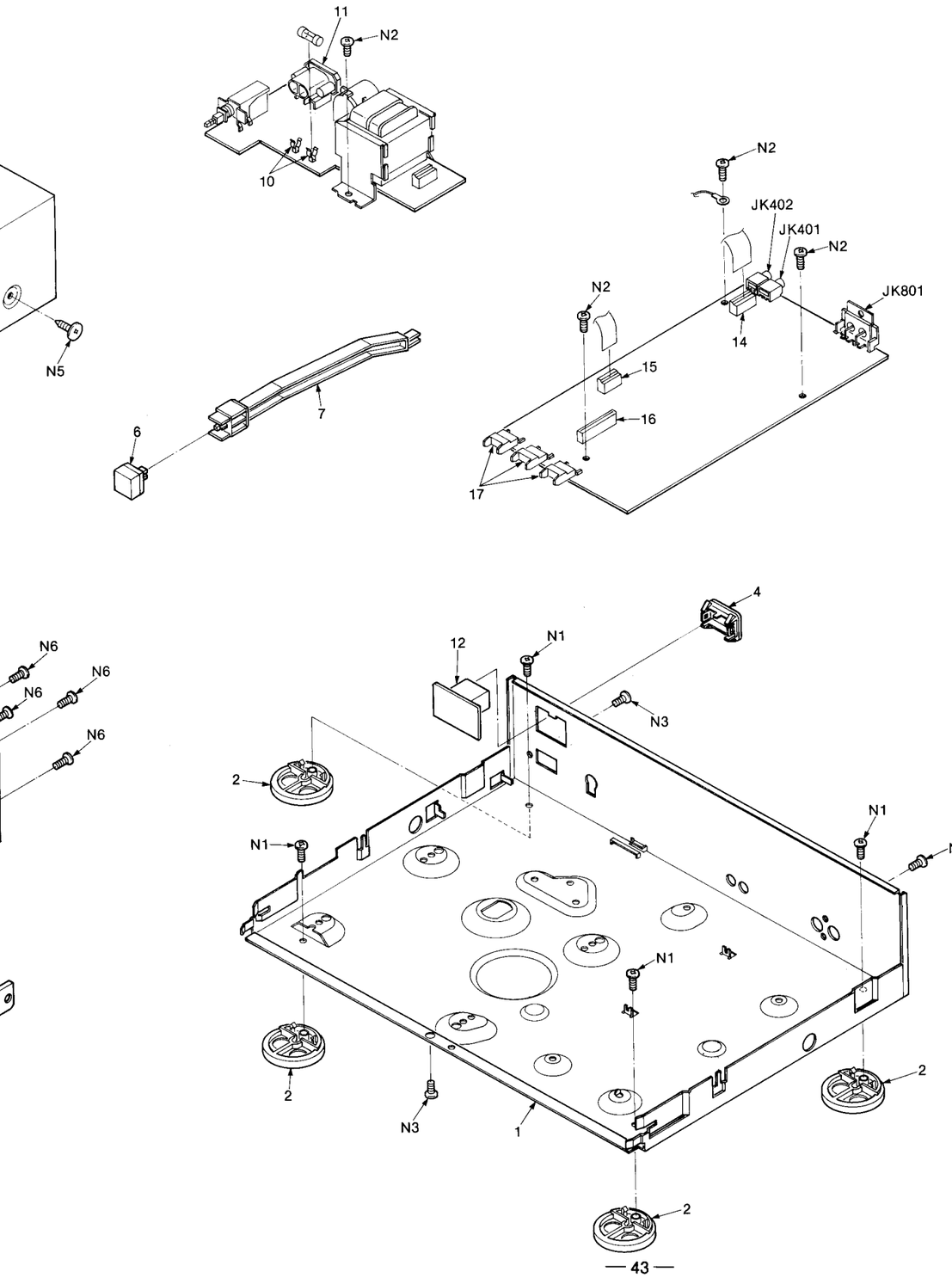








5 6 7 8 9 10 11 12 13 14



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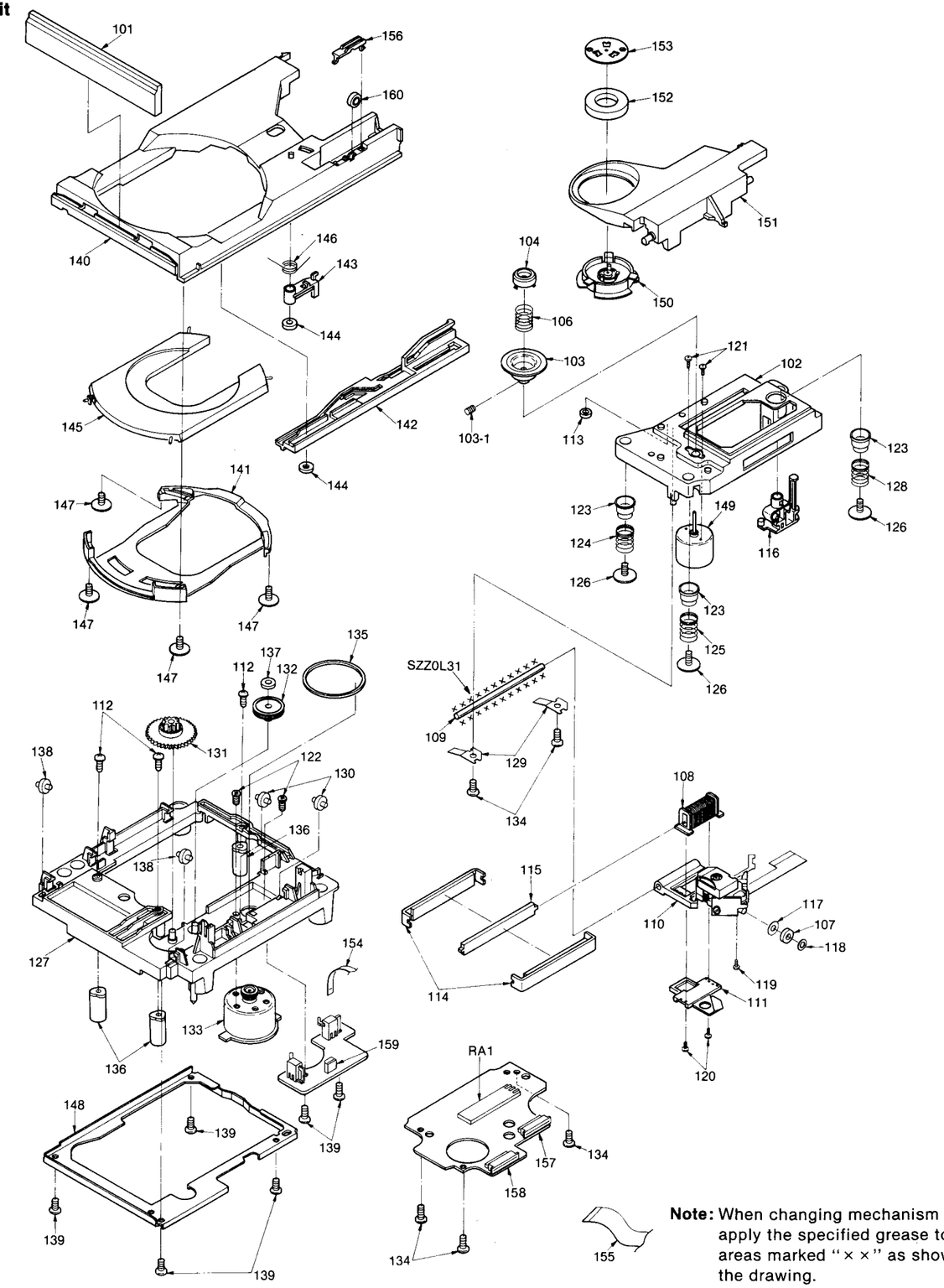
• Loading unit

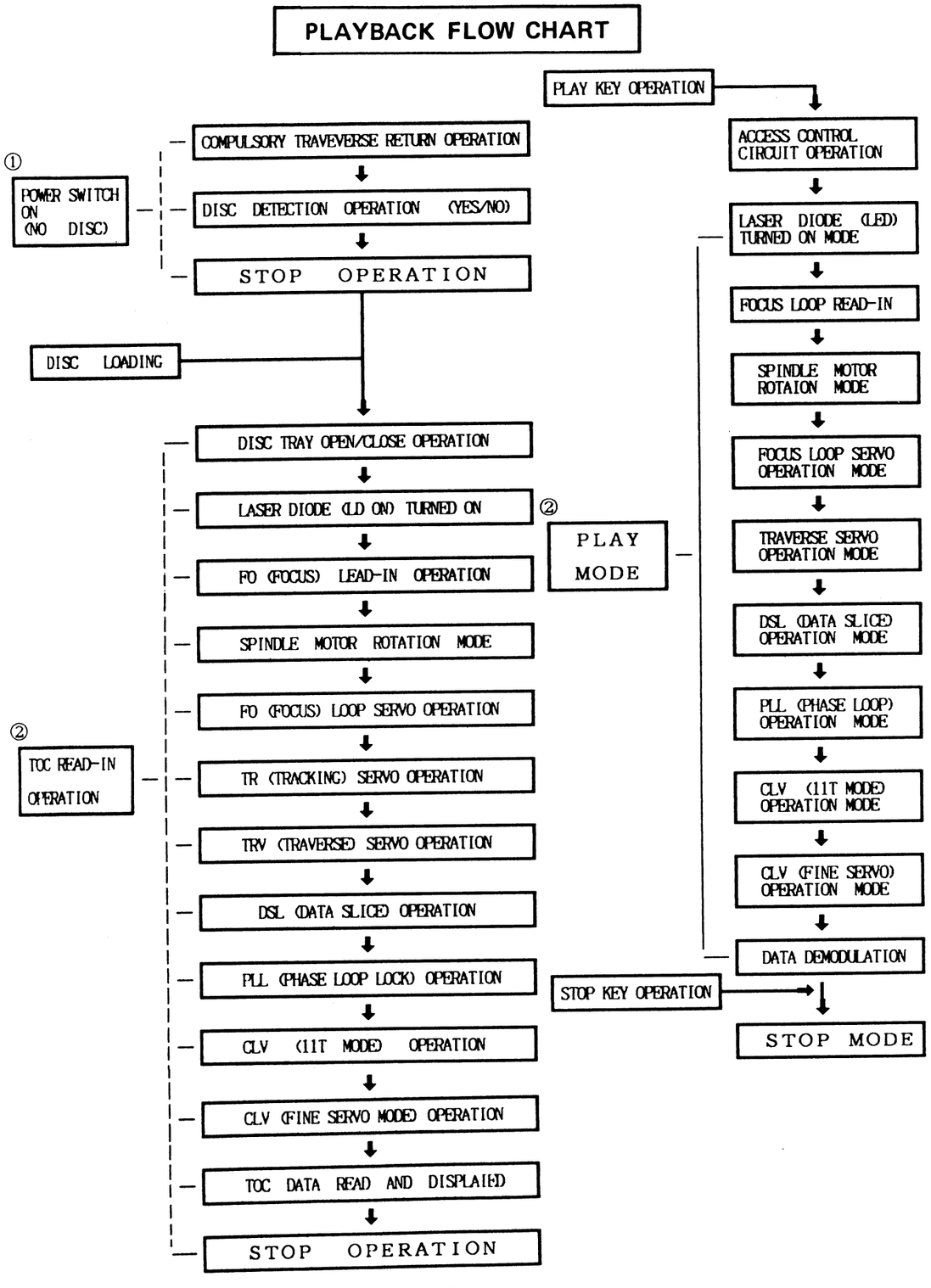


— 44 —

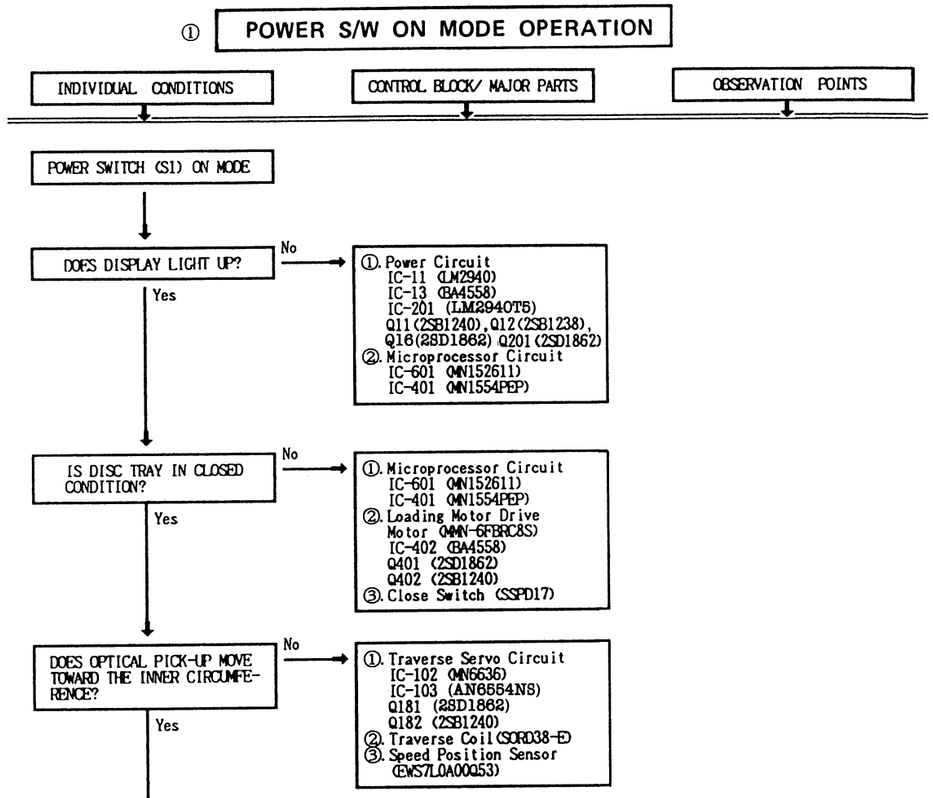
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

■TROUBLESHOOTING GUIDE

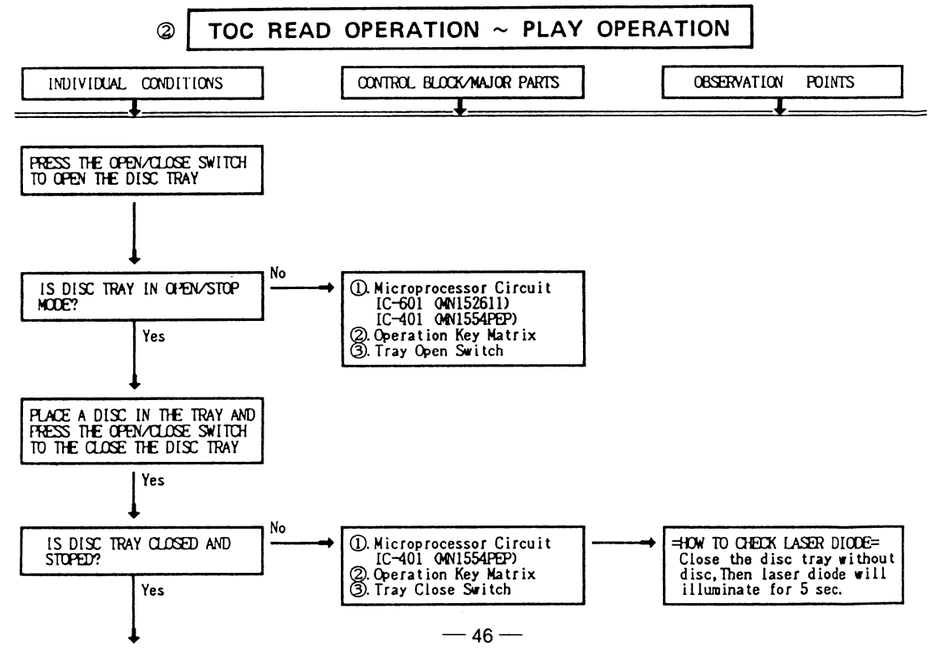
PLAYBACK FLOW CHART

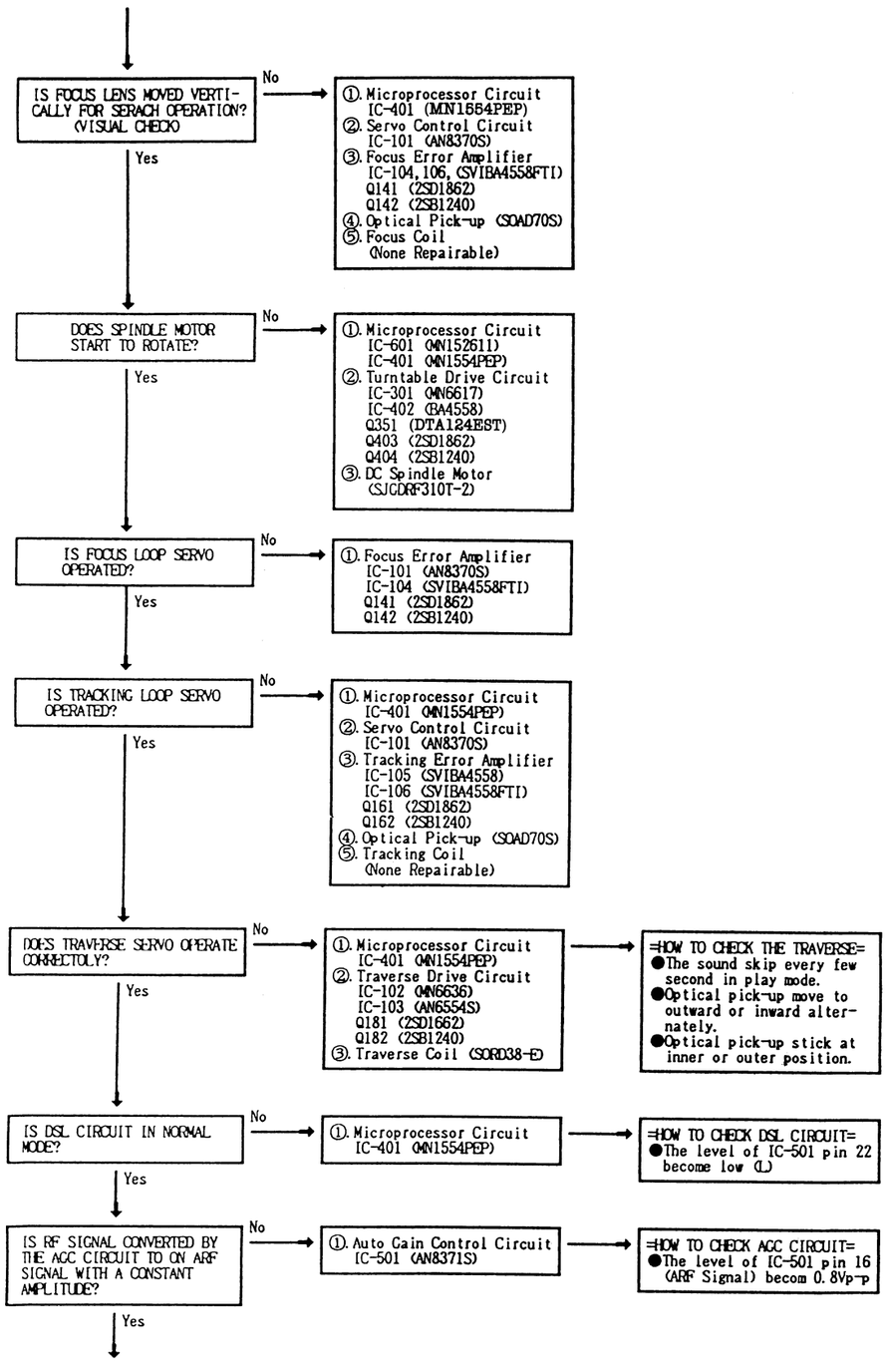


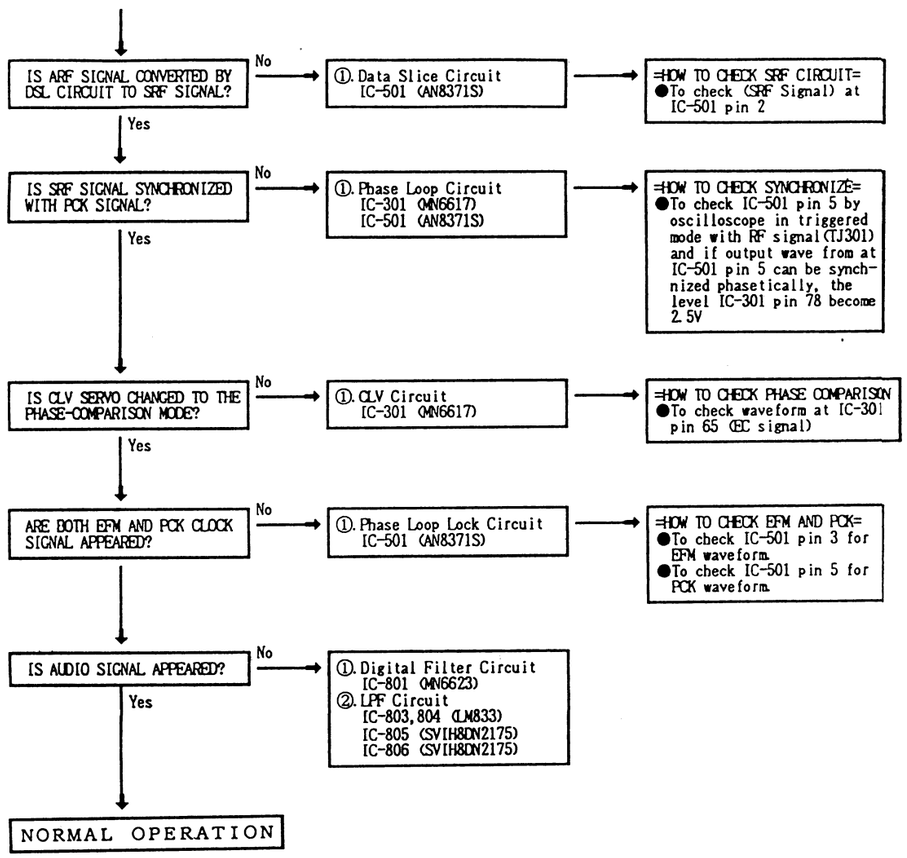
① POWER S/W ON MODE OPERATION



② TOC READ OPERATION ~ PLAY OPERATION

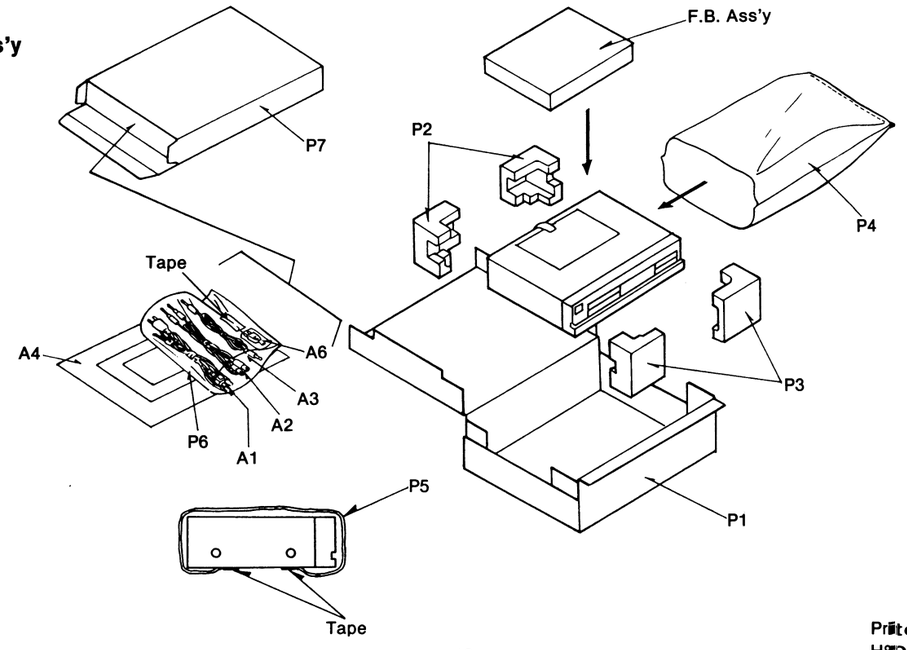

INDIVIDUAL CONDITIONS
CONTROL BLOCK/MAJOR PARTS
OBSERVATION POINTS
PRESS THE OPEN/CLOSE SWITCH TO OPEN THE DISC TRAY
IS DISC TRAY IN OPEN/STOP MODE?
No
①. Microprocessor Circuit
IC-601 (MN152611)
IC-401 (MN1554PEP)
②. Operation Key Matrix
③. Tray Open Switch
Yes
PLACE A DISC IN THE TRAY AND PRESS THE OPEN/CLOSE SWITCH TO THE CLOSE THE DISC TRAY
Yes
IS DISC TRAY CLOSED AND STOPED?
No
①. Microprocessor Circuit
IC-401 (MN1554PEP)
②. Operation Key Matrix
③. Tray Close Switch
=HOW TO CHECK LASER DIODE=
Close the disc tray without disc, Then laser diode will illuminate for 5 sec.
Yes


IS FOCUS LENS MOVED VERTICALLY FOR SERACH OPERATION? (VISUAL CHECK)
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Servo Control Circuit IC-101 (AN8370S)
③. Focus Error Amplifier IC-104,106, (SVIBA4558FTI) Q141 (2SD1862) Q142 (2SB1240)
④. Optical Pick-up (SOAD70S)
⑤. Focus Coil (None Repairable)
Yes
DOES SPINDLE MOTOR START TO ROTATE?
No
①. Microprocessor Circuit IC-601 (MN152611) IC-401 (MN1554PEP)
②. Turntable Drive Circuit IC-301 (MN6617) IC-402 (BA4558) Q351 (DTA124EST) Q403 (2SD1862) Q404 (2SB1240)
③. DC Spindle Motor (SJGDRF310T-2)
Yes
IS FOCUS LOOP SERVO OPERATED?
No
①. Focus Error Amplifier IC-101 (AN8370S) IC-104 (SVIBA4558FTI) Q141 (2SD1862) Q142 (2SB1240)
Yes
IS TRACKING LOOP SERVO OPERATED?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Servo Control Circuit IC-101 (AN8370S)
③. Tracking Error Amplifier IC-105 (SVIBA4558) IC-106 (SVIBA4558FTI) Q161 (2SD1862) Q162 (2SB1240)
④. Optical Pick-up (SOAD70S)
⑤. Tracking Coil (None Repairable)
Yes
DOES TRAVERSE SERVO OPERATE CORRECTOLY?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
②. Traverse Drive Circuit IC-102 (AN6636) IC-103 (AN6554S) Q181 (2SD1662) Q182 (2SB1240)
③. Traverse Coil (SORD38-E)
=HOW TO CHECK THE TRAVERSE=
●The sound skip every few second in play mode.
●Optical pick-up move to outward or inward alternately.
●Optical pick-up stick at inner or outer position.
Yes
IS DSL CIRCUIT IN NORMAL MODE?
No
①. Microprocessor Circuit IC-401 (MN1554PEP)
=HOW TO CHECK DSL CIRCUIT=
●The level of IC-501 pin 22 become low (L)
Yes
IS RF SIGNAL CONVERTED BY THE AGC CIRCUIT TO ON ARF SIGNAL WITH A CONSTANT AMPLITUDE?
No
①. Auto Gain Control Circuit IC-501 (AN8371S)
=HOW TO CHECK AGC CIRCUIT=
●The level of IC-501 pin 16 (ARF Signal) becom 0.8Vp-p
Yes


IS ARF SIGNAL CONVERTED BY DSL CIRCUIT TO SRF SIGNAL?
No
①. Data Slice Circuit IC-501 (AN8371S)
=HOW TO CHECK SRF CIRCUIT=
●To check (SRF Signal) at IC-501 pin 2
Yes
IS SRF SIGNAL SYNCHRONIZED WITH PCK SIGNAL?
No
①. Phase Loop Circuit IC-301 (MN6617) IC-501 (AN8371S)
=HOW TO CHECK SYNCHRONIZE=
●To check IC-501 pin 5 by oscilloscope in triggered mode with RF signal (TJ301) and if output wave from at IC-501 pin 5 can be synchnized phasetically, the level IC-301 pin 78 become 2.5V
Yes
IS CLV SERVO CHANGED TO THE PHASE-COMPARISON MODE?
No
①. CLV Circuit IC-301 (MN6617)
=HOW TO CHECK PHASE COMPARISON
●To check waveform at IC-301 pin 65 (EC signal)
Yes
ARE BOTH EFM AND PCK CLOCK SIGNAL APPEARED?
No
①. Phase Loop Lock Circuit IC-501 (AN8371S)
=HOW TO CHECK EFM AND PCK=
●To check IC-501 pin 3 for EFM waveform.
●To check IC-501 pin 5 for PCK waveform.
IS AUDIO SIGNAL APPEARED?
No
①. Digital Filter Circuit IC-801 (MN6623)
②. LPF Circuit IC-803,804 (LM833) IC-805 (SVIH8DN2175) IC-806 (SVIH8DN2175)
Yes
NORMAL OPERATION

■ PACKING

• **F.B. Ass'y**



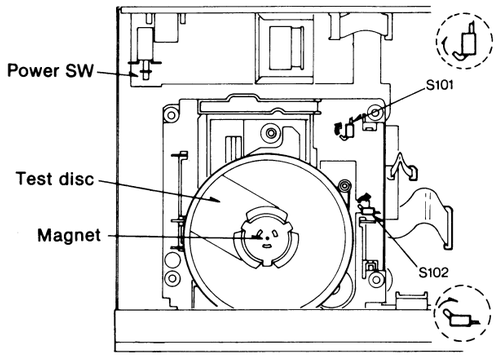
Printed in Japan
H8D50⊖000 AM/TN

■ MEASUREMENTS AND ADJUSTMENTS

Caution:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam, especially when performing adjustments.

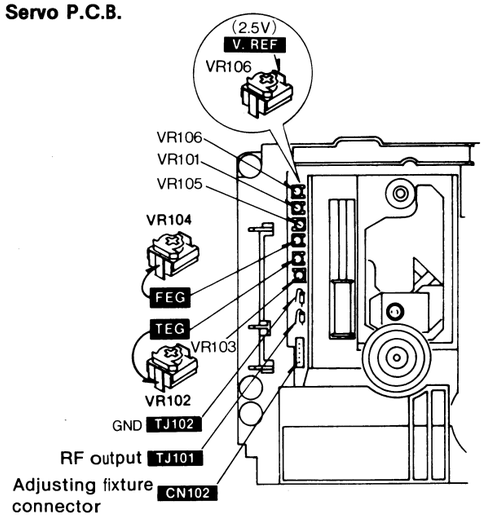
PREPARATION

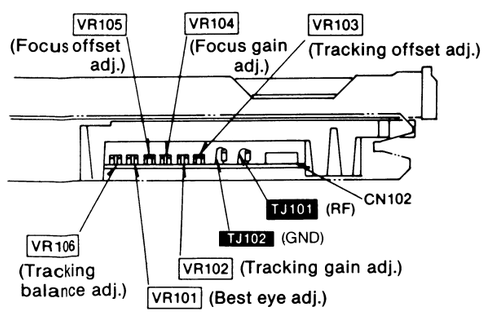
1. Remove the cabinet (see Ref. No. 1 in the original Service Manual).
2. Remove the disc clamper and magnet (see Ref. No. 2 of the same).
3. Remove the disc holder and power switch rod (see Ref. No. 3 of the same).
4. Place the test disc and magnet on the turntable.
5. While holding the Open/Close switches (S101, S102) in the directions indicated by the arrows, switch the player power ON.
6. After the test disc starts rotating, release the Open/Close switch (S101, S102).



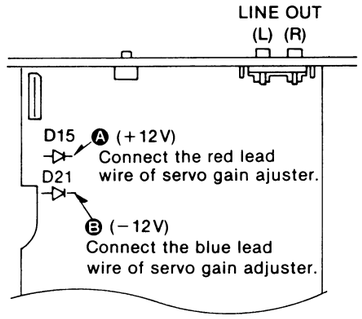
ADJUSTMENT POINTS

• Servo P.C.B.

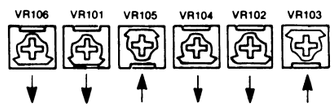




• Main P.C.B.



• Temporary setting of each VR



(Temporary VR setting if any of the trimmer VRs are replaced or require readjustment, temporarily set them to the following positions.)

Measuring Instruments and Special Tools
- * Servo gain adjuster (SZZP1017F)
- * Test discs
- 1. Playability test disc (SZZP1054C or SZZP1014F)
- 2. Uneven test disc (SZZP1056C)
- 3. Black band test disc (SZZP1057C)
- * Normal disc
- * Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT trigger and 1:1 probe).
- * Audio frequency (AF) oscilator
- * Conversion connector (SZZP1032F)
- * Allen wrench (M2.0)
- * Allen wrench (M1.27)
- * 0.9mm clearance gauge (RZZ0297)

Perform adjustments depend on the part to be replaced according to followings:

(1) Spindle motor ..... Items 1, 3 to 8
(2) Turntable ..... Items 1, 3 to 8
(3) Optical pickup ..... Items 2 to 8

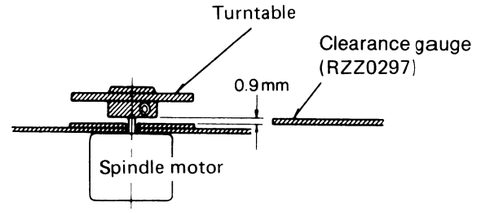
Adjusting Procedure

* If you have replaced the spindle motor or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (−) terminals via a filter.
   (Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)
   Oscilloscope setting: VOLT ..... 50 mV
   SWEEP ..... 1 ms.
   Input coupling ... DC
4. Adjust oscilloscope's DC zero balance.
5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

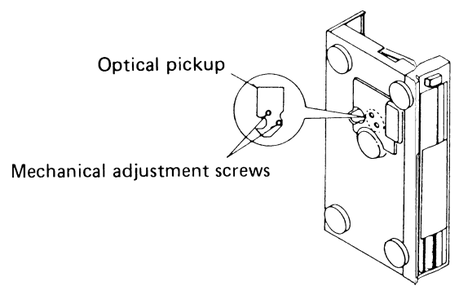
Note 1. If the measured amplitude is within a range of +/− 15mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.
If the amplitude exceeds +15mV, lower turntable.
If the amplitude is below −15mV, elevate the turntable.

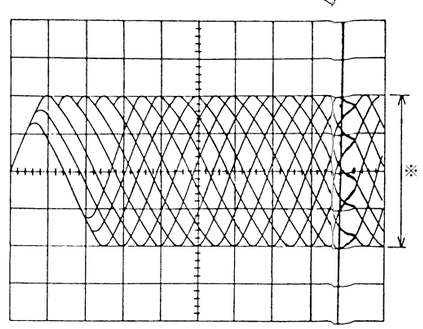


Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B.
   Oscilloscope setting: VOLT ..... 100 mV
   SWEEP ..... 0.5 μs.
   Input coupling ... AC
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1056C).
3. Leave the player in Play mode, and place it on its right side as shown at right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench until the RF signal amplitude variation on the oscilloscope is minimized.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).





※ Minimize the variation of amplitude.

D

ORDER NO. AD8809237S9

Service Manual

Compact Disc Player

SL-PJ25

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Color

(K)...Black Type

Area

Color	Area
(K)	(E).....Continental Europe.
(K)	(EK) .....United Kingdom.
(K)	(XL).....Australia.
(K)	(EG) .....F.R. Germany.
(K)	(EB) .....Belgium.
(K)	(EH) .....Holland.
(K)	(EF).....France.
(K)	(EI).....Italy.
(K)	(XA) .....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB) .....Saudi Arabia.
(K)	(PC) .....European Audio Club.

Modification of the Servo Circuit

Note: The SL-PJ25's servo circuit has been modified during its production. Major changes in its ICs and transistors are listed in the following table (next page). The IC401's peripheral circuit on the D P.C.B. has also been partially modified. The Supplementary Service Manual outlines all the circuitry except for the operation circuit. (No modification has been made to the operation circuit. For a schematic, see page 36 of the original Service Manual.) Use the original Service Manual (Order No. AD8805062C9) together with this Supplementary Service Manual.

CHANGES

Notes (1) Reason for Modifications: To simplify the servo circuit while improving its performance.
(2) Modifications Effective: From July, 1988 and onward
(3) Identification of Modified Units:
1): A serial number suffix of **C** or beyond indicates a modified unit.
2): A "CAUTION" label (THE ORIGINAL DESIGN HAS BEEN CHANGED. REFER TO SERVICE MANUAL (SUPPLEMENT).) has been affixed inside the chassis.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Panasonic Tokyo Sales Department
Matsushita Electric Industrial Co., Ltd.
World Trade Center Bldg., 4-1, Hamamatsu-cho, 2-chome, Minato-ku, Tokyo 105, Japan

MAJOR CHANGES IN SEMICONDUCTOR DEVICES

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	Original →	New		
IC101	AN8370S	**AN8373S**	SERVO AMP	
IC102	MN6636	**AN8374S**	SERVO PROCESSOR	
IC103	AN6554NS	**AN8377**	BTL DRIVE	
IC104	AN6552S	**LM2940T5M**	REGULATOR	
IC105~106	AN6552S	**Deletion**	———	
IC201	LM2940T5	**Deletion**	———	
IC202	AN6552S	**Deletion**	———	
IC501	AN8371S	**Deletion**	———	
IC401 *	MN1554PEP	**MN1554PEW**	SYSTEM CONTROL	
Q101	2SA1547-Q	**2SA1547QSTV2**	A.P.C.	
Q141	2SD1862-P	**Deletion**	———	
Q142	2SB1240-P	**Deletion**	———	
Q161	2SD1862-P	**Deletion**	———	
Q162	2SB1240-P	**Deletion**	———	
Q181	2SD1862-P	**Deletion**	———	
Q182	2SB1240-P	**Deletion**	———	
Q201, 203	2SD1862-P	**Deletion**	———	

* IC401: System-controlling microprocessor on the D P.C.B. All other ICs and transistors listed in this table are used on the B Servo P.C.B.
* A comprehensive electrical parts list, regarding the servo circuit, appears on pages 21~23 of this Supplementary Service Manual.
(None of the mechanical parts have been affected by these modifications. Refer to the original Service Manual.)

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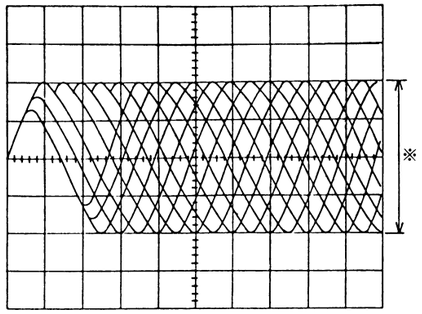
NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)	24

(3) BEST EYE (PD BALANCE) ADJUSTMENT

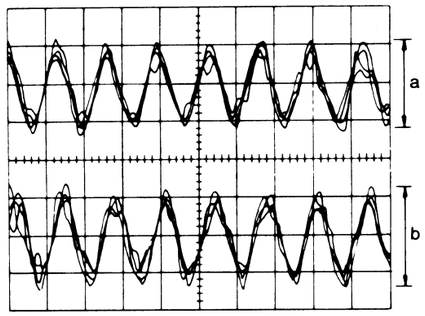
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 0.5µs.
   Input coupling . . . AC
2. Switch the player power **ON**, and play the 0.5 mm black dot on the test disc (SZZP1014F or SZZP1054C).
3. Adjust **VR101** until the RF signal eye pattern amplitude is maximized.



※ Maximize the amplitude.

(4) FOCUS GAIN ADJUSTMENT

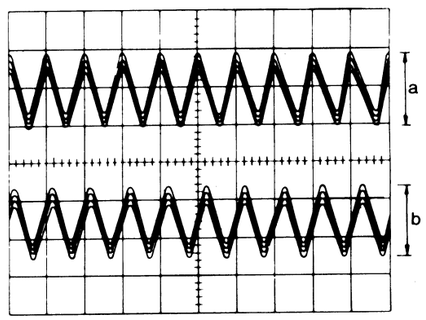
1. Connect the servo gain adjuster to the player (see page 7).
2. Set the servo gain adjuster's gain switch to position **"2"** and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position **"2"**.



※ Adjust **VR104** until a equals b.

(5) TRACKING GAIN ADJUSTMENT

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position **"2"**.

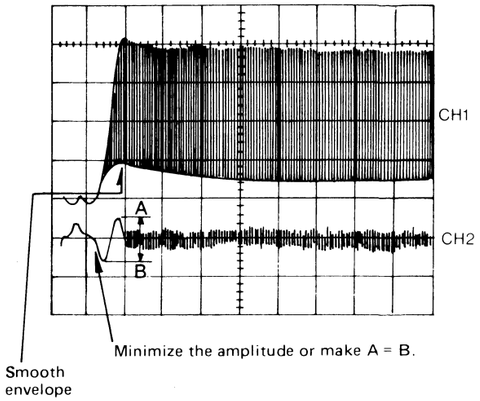


※ Adjust VR102 until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position **"2"**.

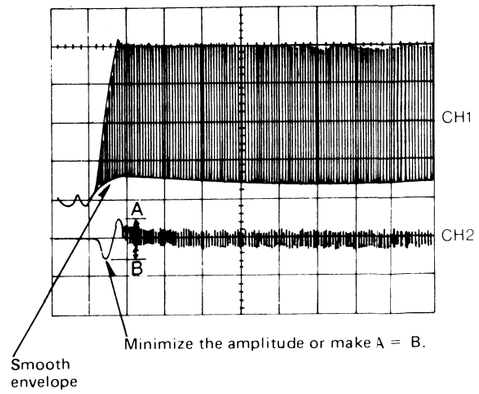
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . . AC (both CH. 1 and 2)
   Trigger mode . . . .NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(7) TRACKING OFFSET ADJUSTMENT

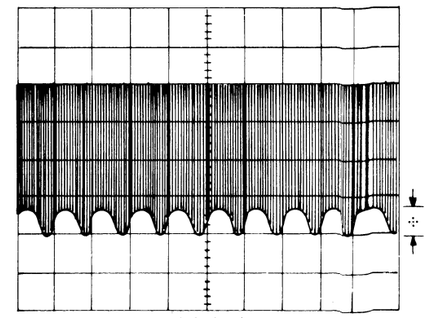
Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . AC (both CH. 1 and 2)
   Trigger mode. . . NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(8) TRACKING BALANCE ADJUSTMENT

1. Make sure that servo gain adjuster's gain switch is set to position **"2"**.
2. Set up the AF oscillator output for **1.1 kHz, 600 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   200 mV (CH. 2)
   SWEEP. . . . . .0.1 ms.
   Input coupling . .AC (both CH. 1 and 2)
   Trigger mode . . .NORM (trigger CH. 2)
4. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
5. Set the servo gain adjuster's gain switch to position **"1"**, and adjust **VR106** until the jitter contained in the signal waveform on CH. 1 is minimized as shown below.
6. Disconnect the servo gain adjuster's leads from the player.



⁜ Jitter should be minimized.

- **IC103 (AN8377): BTL drive**

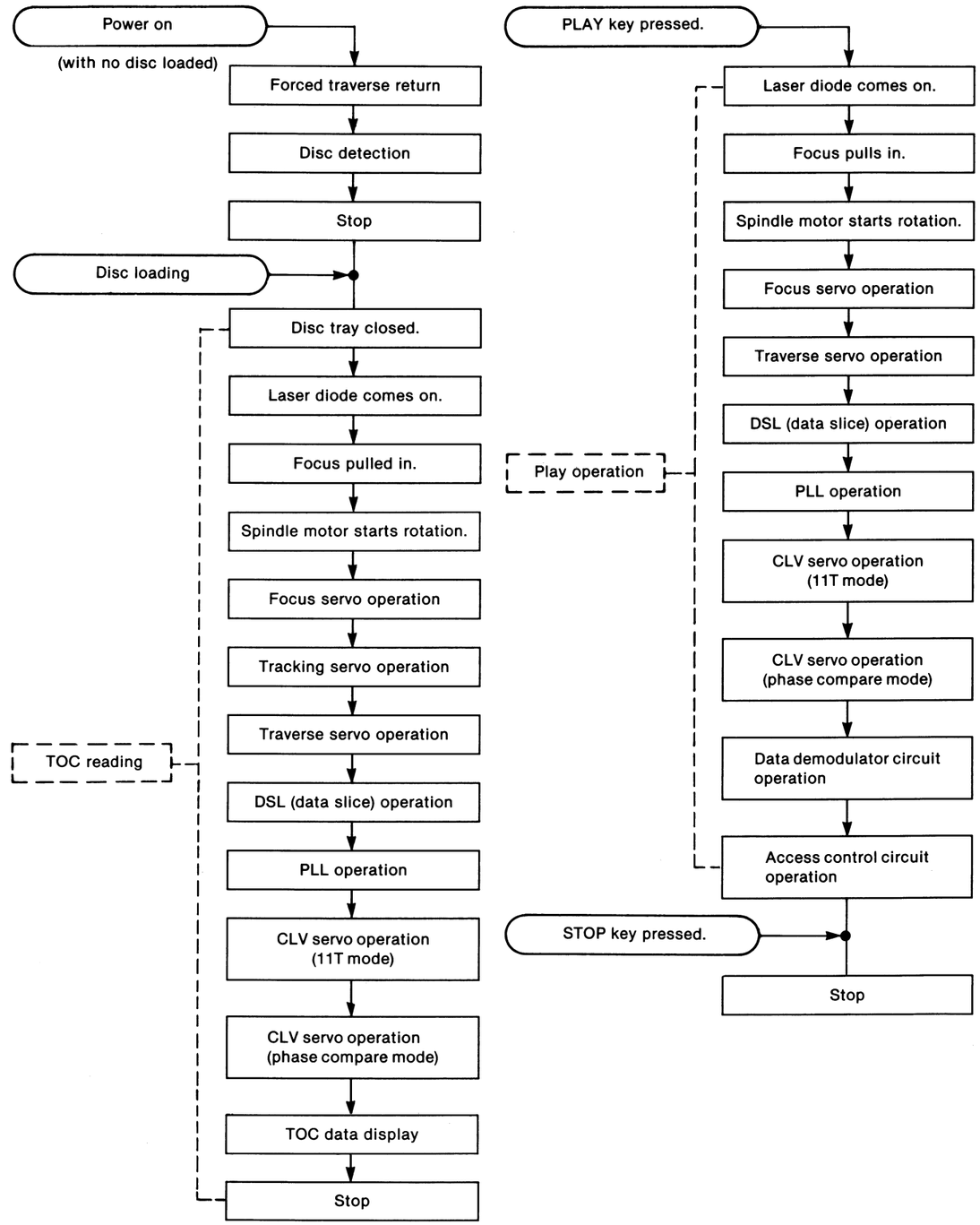
Pin No.	Mark	I/O Division	Function
1	PVCC	I	Driver power supply (+5 V input)
2	VCC	I	Power supply (+5 V input)
3	TB	O	External transistor base driving output
4	VMON	O	Voltage (+5 V) output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD–	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD–	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD–	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse driver
15	$\overline{\text{RESET}}$	O	Reset signal output
16	PC	I	PC input (connect to GND)

■ TROUBLESHOOTING GUIDE

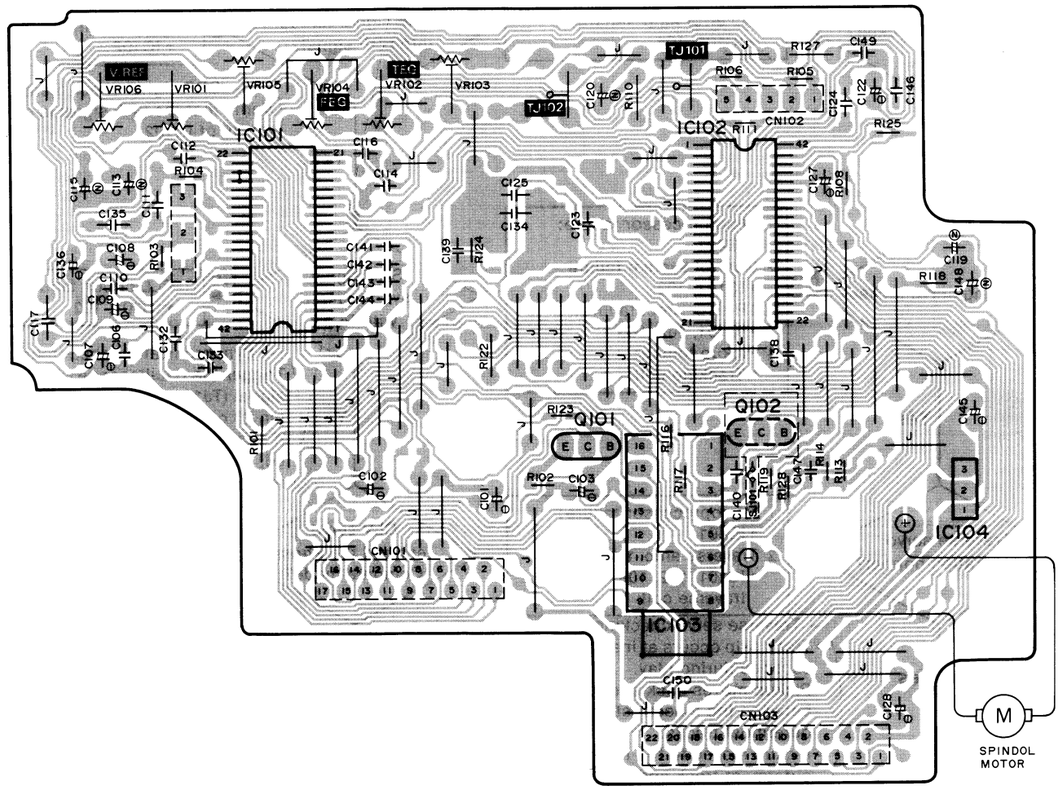
SL-PJ25 Operation Sequence Check Sheet

Play Operation Sequence



■ PRINTED CIRCUIT BOARDS

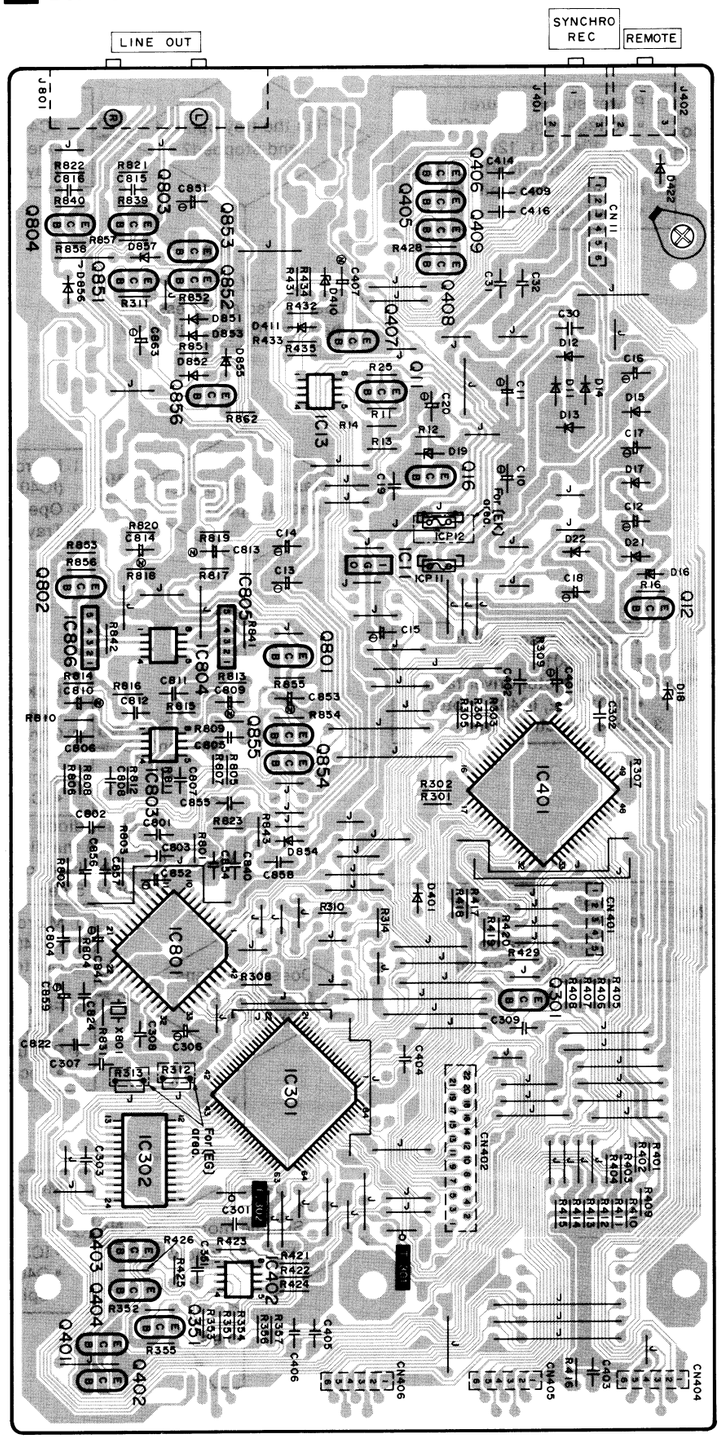
B SERVO P.C.B.



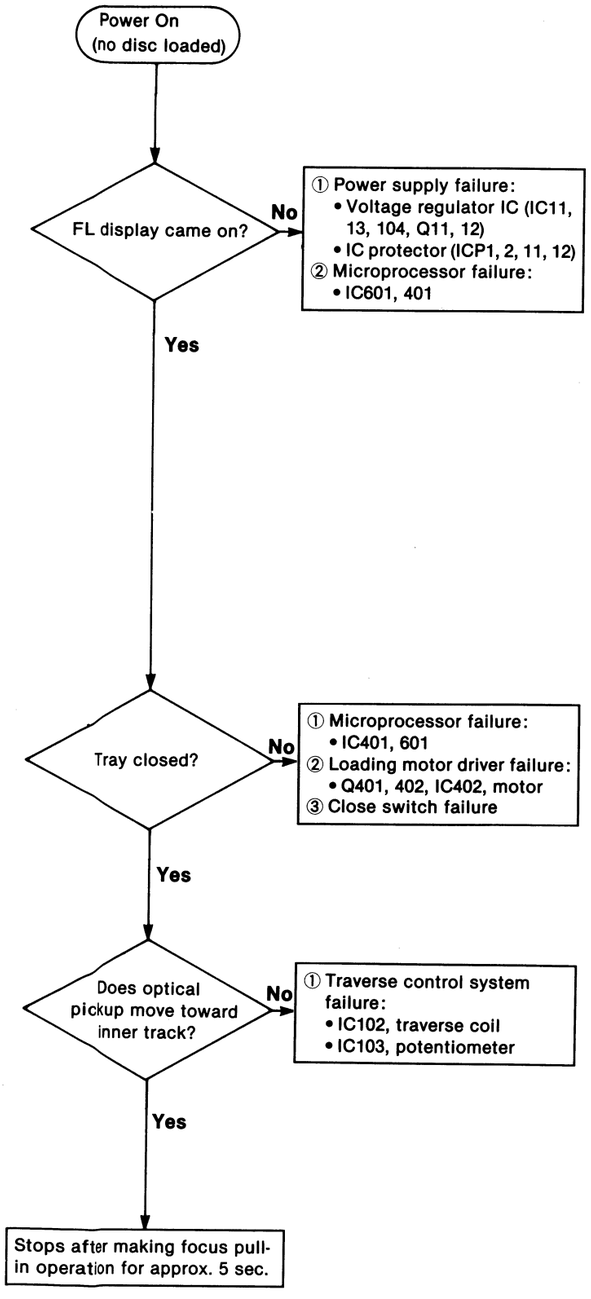
Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)

IC103 / Modifications	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Removed	2SB1240QR Added
C140	0.01µF	Removed
C145	6V 100µF	Removed
Jumper SJ101	Removed	Shorted

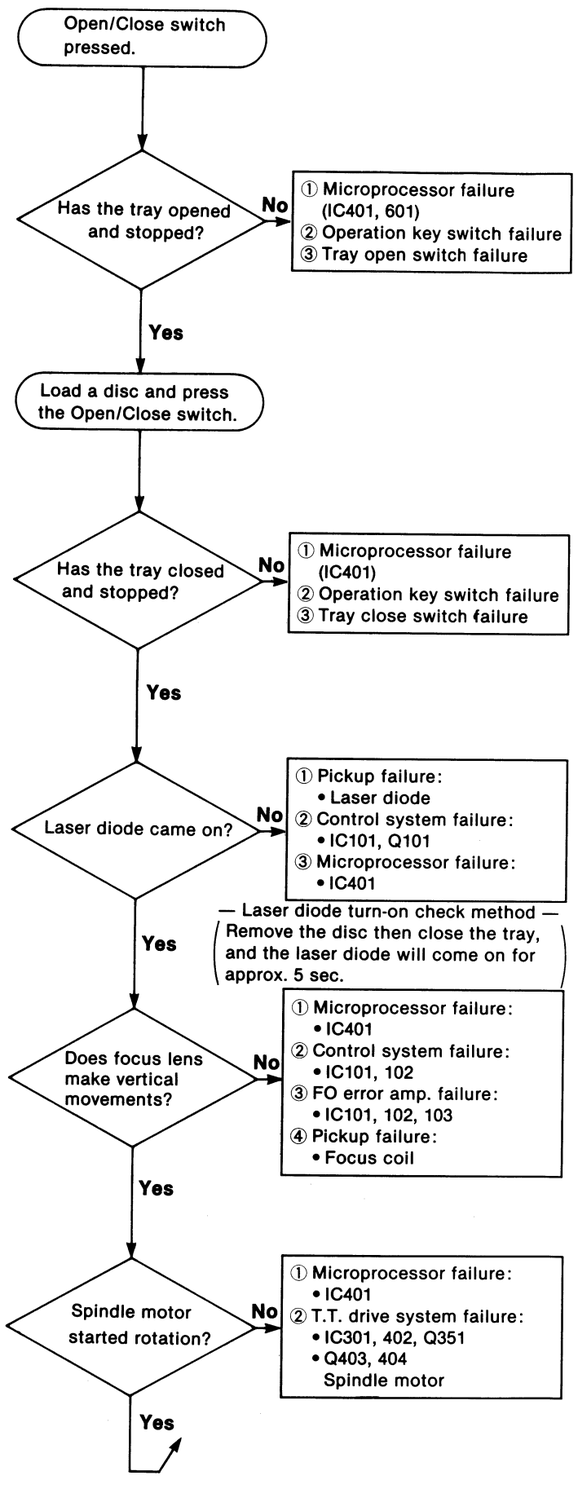
D D/A CONVERTER/AUDIO P.C.B.

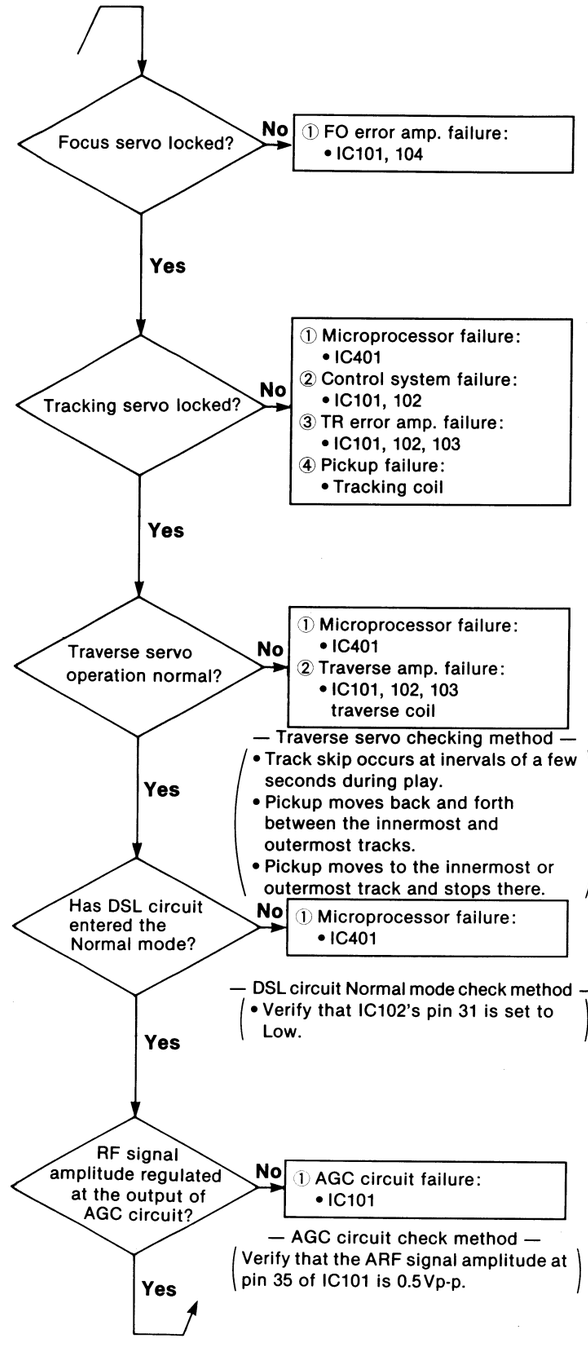


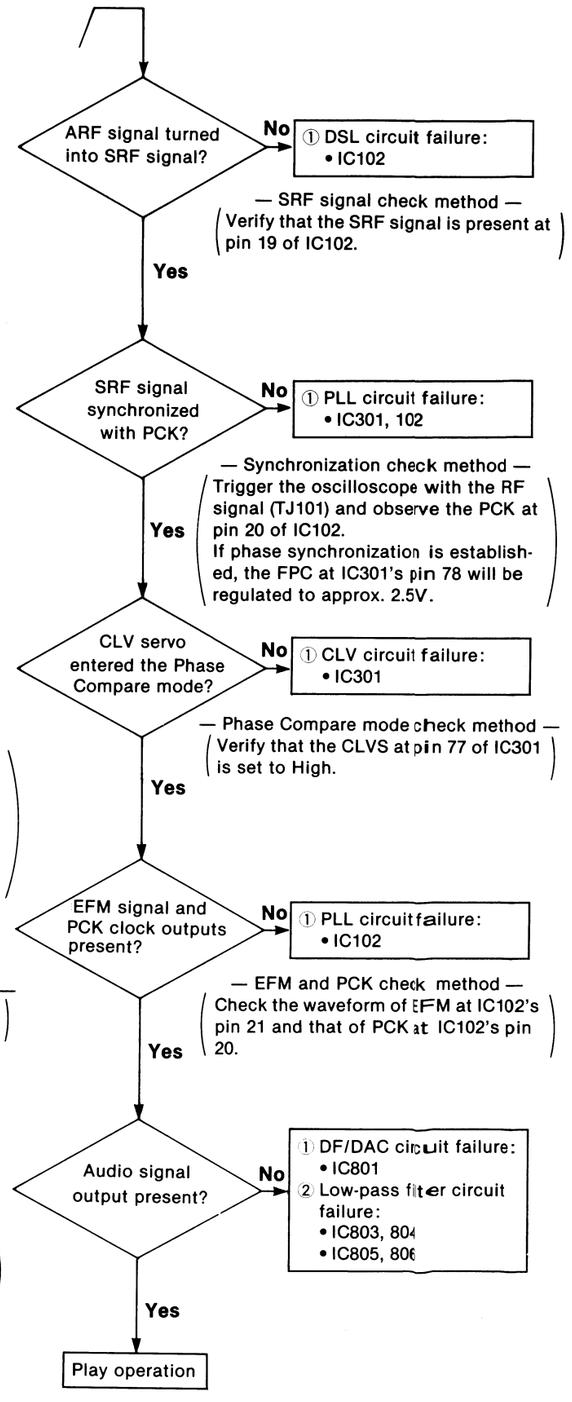
(Operation Sequence Just After Power On)

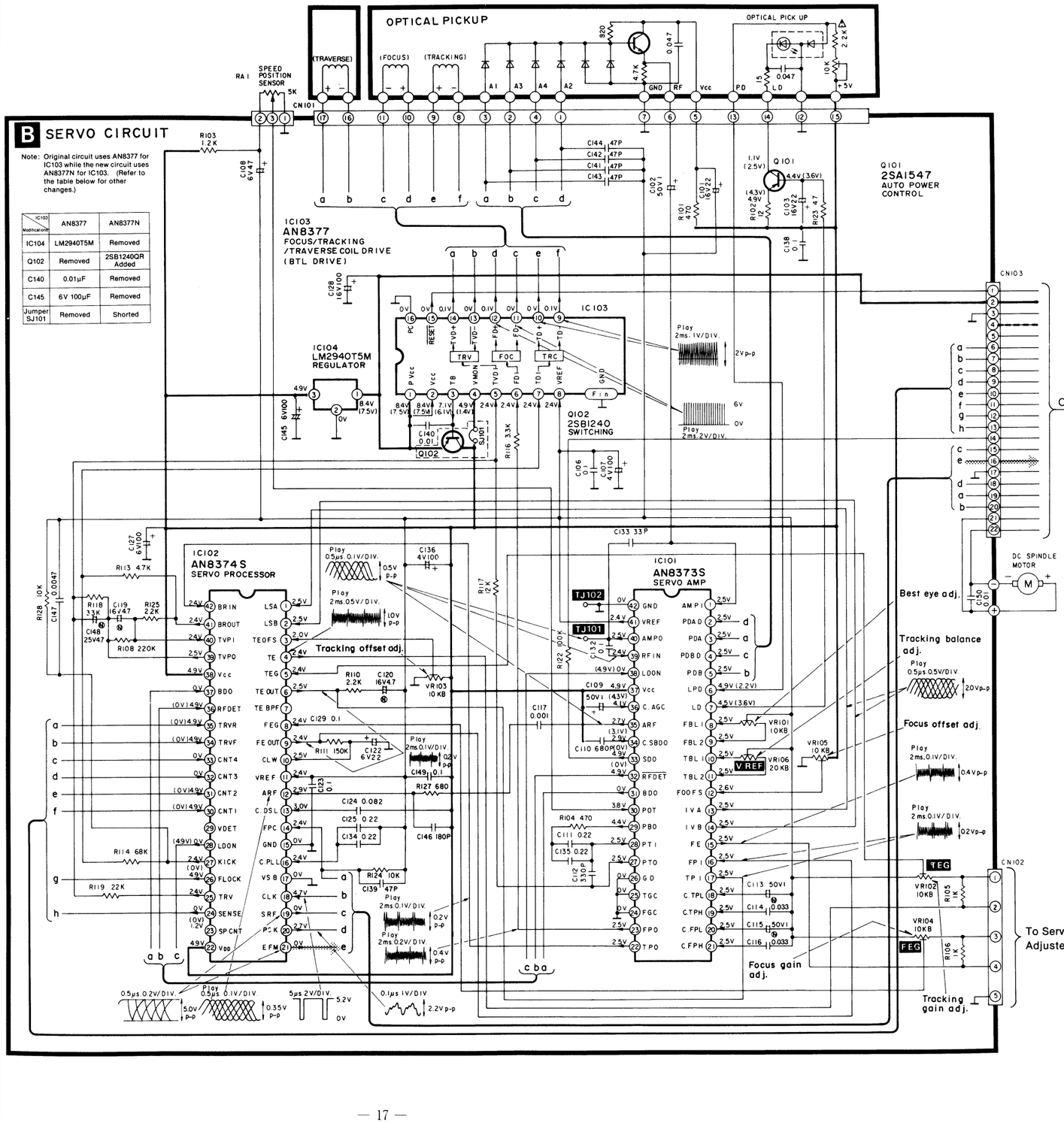


(TOC Read Operation-PLAY Operation)




Focus servo locked?
No
① FO error amp. failure:
• IC101, 104
Yes
Tracking servo locked?
No
① Microprocessor failure:
• IC401
② Control system failure:
• IC101, 102
③ TR error amp. failure:
• IC101, 102, 103
④ Pickup failure:
• Tracking coil
Yes
Traverse servo operation normal?
No
① Microprocessor failure:
• IC401
② Traverse amp. failure:
• IC101, 102, 103
traverse coil
— Traverse servo checking method —
• Track skip occurs at inervals of a few seconds during play.
• Pickup moves back and forth between the innermost and outermost tracks.
• Pickup moves to the innermost or outermost track and stops there.
Yes
Has DSL circuit entered the Normal mode?
No
① Microprocessor failure:
• IC401
— DSL circuit Normal mode check method —
• Verify that IC102's pin 31 is set to Low.
Yes
RF signal amplitude regulated at the output of AGC circuit?
No
① AGC circuit failure:
• IC101
— AGC circuit check method —
Verify that the ARF signal amplitude at pin 35 of IC101 is 0.5Vp-p.
Yes


ARF signal turned into SRF signal?
No
① DSL circuit failure:
• IC102
— SRF signal check method —
Verify that the SRF signal is present at pin 19 of IC102.
Yes
SRF signal synchronized with PCK?
No
① PLL circuit failure:
• IC301, 102
— Synchronization check method —
Trigger the oscilloscope with the RF signal (TJ101) and observe the PCK at pin 20 of IC102.
If phase synchronization is established, the FPC at IC301's pin 78 will be regulated to approx. 2.5V.
Yes
CLV servo entered the Phase Compare mode?
No
① CLV circuit failure:
• IC301
— Phase Compare mode check method —
Verify that the CLVS at pin 77 of IC301 is set to High.
Yes
EFM signal and PCK clock outputs present?
No
① PLL circuit failure:
• IC102
— EFM and PCK check method —
Check the waveform of EFM at IC102's pin 21 and that of PCK at IC102's pin 20.
Yes
Audio signal output present?
No
① DF/DAC circuit failure:
• IC801
② Low-pass filter circuit failure:
• IC803, 804
• IC805, 806
Yes
Play operation


B SERVO CIRCUIT
Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)
IC103 Modification
AN8377
AN8377N
IC104 LM2940T5M Removed
Q102 Removed 2SB1240QR Added
C140 0.01µF Removed
C145 6V 100µF Removed
Jumper SJ101 Removed Shorted
OPTICAL PICKUP
(TRAVERSE)
(FOCUS)
(TRACKING)
OPTICAL PICK UP
SPEED POSITION SENSOR
CN101
IC103
AN8377
FOCUS/TRACKING /TRAVERSE COIL DRIVE (BTL DRIVE)
IC104
LM2940T5M
REGULATOR
Q102
2SB1240
SWITCHING
Q101
2SA1547
AUTO POWER CONTROL
IC102
AN8374S
SERVO PROCESSOR
IC101
AN8373S
SERVO AMP
CN103
CN402
CN102
DC SPINDLE MOTOR
Best eye adj.
Tracking balance adj.
Focus offset adj.
Tracking gain adj.
Focus gain adj.
Tracking offset adj.
To Servo Gain Adjuster
TEG
FEG
TJ102
TJ101
VREF
C MOTOR/ SWITCH CIRCUIT
LOADING MOTOR
S101
S102 OPEN/CLOSE DETECTOR
CN701
CN401
D D/A CONVERTER/AUDIO CIRCUIT
Q401 2SD1862 MOTOR DRIVE
Q402 2SB1240 MOTOR DRIVE
IC402 BA4558FTI MOTOR DRIVE
Q301 DTC124ES SWITCHING
TJ302
TJ301
Q403 2SD1862 MOTOR DRIVE
Q404 2SB1240 MOTOR DRIVE
Q351 DTA124EST SWITCHING
IC13 BA4558FTI STABILIZER
IC302 CXK5816M 16K RAM
IC401 MN1554
Q407 DTC124ES RESET
CN405
CN406
CN404
CN602
CN603
CN601
To A OPERATION CIRCUIT

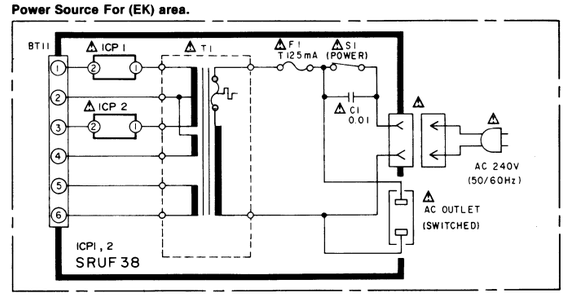
■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

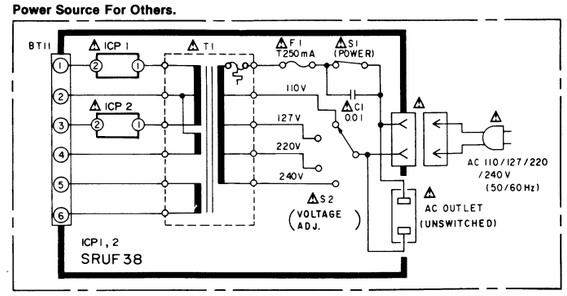
Notes:

- **S1** : Power switch in "**on**" position.
- **S2** : Voltage selector switch. (For [XA], [XB] and [PC] only.)
- **S101** : Disc holder open/close detection switch.
- **S102** : Disc holder open/close detection switch.
- **S601** : Open/close switch.
- **S602** : Stop switch.
- **S603** : Pause switch.
- **S604** : Play switch.
- **S605** : Repeat switch.
- **S606** : Program switch.
- **S607** : Backward skip/search switch.
- **S608** : Forward skip/search switch.
- **S609** : Preset edit play switch.
- **S610** : Time-mode select switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice: Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ——□—— --□-- : Positive voltage lines and negative voltage lines.
  ⋯⋯ : Audio signal lines.

Power Source For (EK) area.



Power Source For Others.



■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System For Resistors

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Unique
ECEA	50	M		330
Type	Voltage (50V)	Characteristics		Value (33μF)

- Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
- Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Chip Resistor			
ERJ	: Chip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 −20 %
ECQM	: Polyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R11	ERDS2TJ101	100 1/4
R12	ERDS2TJ331	330 1/4
R13	ERDS2TJ103	10K 1/4
R14	ERDS2TJ103	10K 1/4
R16	ERDS2TJ102	1K 1/4
R25	ERDS2TJ471	470 1/4
R301	ERDS2TJ472	4.7K 1/4
R302	ERDS2TJ472	4.7K 1/4
R303	ERDS2TJ472	4.7K 1/4
R304	ERDS2TJ472	4.7K 1/4
R305	ERDS2TJ472	4.7K 1/4
R307	ERDS2TJ104	100K 1/4
R308	ERDS2TJ471	470 1/4
R309	ERDS2TJ472	4.7K 1/4
R310	ERDS2TJ222	2.2K 1/4
R311	ERDS2TJ472	4.7K 1/4
R312	ERDS2TJ100	10 1/4
[EG]		
R313	ERDS2TJ100	10 1/4
[EG]		
R314	ERDS2TJ182	1.8K 1/4
R351	ERDS2TJ103	10K 1/4
R352	ERDS2TJ154	150K 1/4
R353	ERDS2TJ123	12K 1/4
R354	ERDS2TJ154	150K 1/4
R355	ERDS2TJ333	33K 1/4
R356	ERDS2TJ333	33K 1/4
R401	ERDS2TJ221	220 1/4
R402	ERDS2TJ221	220 1/4
R403	ERDS2TJ221	220 1/4
R404	ERDS2TJ221	220 1/4
R405	ERDS2TJ221	220 1/4
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ221	220 1/4
R408	ERDS2TJ221	220 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ472	4.7K 1/4
R416	ERDS2TJ472	4.7K 1/4
R417	ERDS2TJ472	4.7K 1/4
R418	ERDS2TJ472	4.7K 1/4
R419	ERDS2TJ472	4.7K 1/4
R420	ERDS2TJ472	4.7K 1/4
R421	ERDS2TJ913T	91K 1/4
R422	ERDS2TJ913T	91K 1/4
R423	ERDS2TJ124	120K 1/4
R424	ERDS2TJ124	120K 1/4
R425	ERDS2TJ101	100 1/4
R426	ERDS2TJ101	100 1/4
R428	ERDS2TJ103	10K 1/4
R429	ERDS2TJ472	4.7K 1/4
R431	ERDS2TJ472	4.7K 1/4
R432	ERDS2TJ101	100 1/4
R433	ERDS2TJ153	15K 1/4
R434	ERDS2TJ393	39K 1/4
R435	ERDS2TJ102	1K 1/4
R601	ERDS2TJ104	100K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R608	ERDS2TJ472	4.7K 1/4
R609	ERDS2TJ330	33 1/4
R610	ERDS2TJ330	33 1/4
R801	ERDS2TJ103	10K 1/4
R802	ERDS2TJ103	10K 1/4
R803	ERDS2TJ103	10K 1/4
R804	ERDS2TJ103	10K 1/4
R805	ERDS2TJ223	22K 1/4
R806	ERDS2TJ223	22K 1/4
R807	ERDS2TJ223	22K 1/4
R808	ERDS2TJ223	22K 1/4
R809	ERDS2TJ473	47K 1/4
R810	ERDS2TJ473	47K 1/4
R811	ERDS2TJ473	47K 1/4
R812	ERDS2TJ473	47K 1/4
R813	ERDS2TJ221	220 1/4
R814	ERDS2TJ221	220 1/4
R815	ERDS2TJ474	470K 1/4
R816	ERDS2TJ474	470K 1/4
R817	ERDS2TJ104	100K 1/4
R818	ERDS2TJ104	100K 1/4
R819	ERDS2TJ681	680 1/4
R820	ERDS2TJ681	680 1/4
R821	ERDS2TJ473	47K 1/4
R822	ERDS2TJ473	47K 1/4
R823	ERDS2TJ331	330 1/4
R831	ERDS2TJ472	4.7K 1/4
R839	ERDS2TJ121	120 1/4
R840	ERDS2TJ121	120 1/4
R841	ERDS2TJ105	1M 1/4
R842	ERDS2TJ105	1M 1/4
R843	ERDS2TJ331	330 1/4
R851	ERDS2TJ102	1K 1/4
R852	ERDS2TJ471	470 1/4
R853	ERDS2TJ333	33K 1/4
R854	ERDS2TJ183	18K 1/4
R855	ERDS2TJ102	1K 1/4
R856	ERDS2TJ102	1K 1/4
R857	ERDS2TJ102	1K 1/4
R858	ERDS2TJ102	1K 1/4
R862	ERDS2TJ102	1K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1 ⚠	ECKDKC103PFZ	0.01
C10	ECEA1CU222	2200 16
C11	ECEA1CU222	2200 16
C12 ⚠	ECEA1VU101	100 35
C13	ECEA1AU101	100 10
C14	ECEA1AU101	100 10
C15	ECEA0JU470	47 6.3
C16	ECEA1CU331	330 16
C17	ECEA1CU331	330 16
C18	ECEA1VU101	100 35
C19	ECBT1C103NS5	0.01 16
C20	ECEA1CU221	220 16
C30	ECKD1H101KB	100P 50
C31	ECBT1C103NS5	0.01 16

Ref. No.	Part No.	Value.
C32	ECBT1C103NS5	0.01 16
C301	ECFR1E104ZF5	0.1 25
C302	ECBT1C103NS	0.01 16
C303	ECFR1E104ZF5	0.1 25
C306	ECEA0JS331	330 6.3
C307	ECFR1E104ZF5	0.1 25
C308	ECFR1E104ZF5	0.1 25
C309	ECBT1C103NS5	0.01 16
C351	ECBT1H102KB5	0.001 50
C401	ECEA0JU470	47 6.3
C402	ECFR1E104ZF5	0.1 25
C403	ECFR1E104ZF5	0.1 25
C404	ECFR1E104ZF5	0.1 25
C405	ECBT1H102KB5	0.001 50
C406	ECBT1H102KB5	0.001 50
C407	ECEA1HN010S	1 50
C409	ECBT1C103NS5	0.01 16
C414	ECBT1C103NS5	0.01 16
C416	ECBT1C103NS5	0.01 16
C601	RCBC1H101KBY	100P 50
C602	RCBC1H101KBY	100P 50
C603	RCBC1H101KBY	100P 50
C604	RCBC1H101KBY	100P 50
C801	ECBT1H680K5	68P 50
C802	ECBT1H680K5	68P 50
C803	ECBT1H680K5	68P 50
C804	ECBT1H680K5	68P 50
C805	ECBT1H470J5	47P 50
C806	ECBT1H470J5	47P 50
C807	ECBT1H470J5	47P 50
C808	ECBT1H470J5	47P 50
C809	ECEA1EN3R3S	3.3 25
C810	ECEA1EN3R3S	3.3 25
C811	ECBT1H102KB5	0.001 50
C812	ECBT1H102KB5	0.001 50
C813	ECEA1CN220S	22 16
C814	ECEA1CN220S	22 16
C815	ECBT1H102KB5	0.001 50
C816	ECBT1H102KB5	0.001 50
C822	ECBT1H5R6K5	5.6P 50
C824	ECBT1H5R6K5	5.6P 50
C840	ECFR1E104ZF5	0.1 25
C841	ECEA0JS331	330 6.3
C851	ECEA0JU471	470 6.3
C852	ECEA0JS331	330 6.3
C853	ECEA1CN100S	10 16
C854	ECFR1E104ZF5	0.1 25
C855	ECFR1E104ZF5	0.1 25
C856	ECFR1E104ZF5	0.1 25
C857	ECFR1E104ZF5	0.1 25
C858	ECFR1E104ZF5	0.1 25
C859	ECEA0JS331	330 6.3
C863	ECEA1HU3R3	3.3 50
SERVO P.C.B.		
RESISTORS(VALUE,WATTAGE)		
R101	ERDS2TJ471	470 1/4
R102	ERJ6GEYJ120V	12 1/10
R103	ERJ6GEYJ122	1.2K 1/10
R104	ERJ6GEYJ471V	470 1/10
R105	RRJ6GCJ102TE	1K 1/6
R106	RRJ6GCJ102TE	1K 1/6
R108	ERJ6GEYJ224V	220K 1/10
R110	ERDS2TJ222	2.2K 1/4
R111	ERJ6GEYJ154V	150K 1/10
R113	ERJ6GEYJ472V	4.7K 1/10
R114	ERJ6GEYJ683V	68K 1/10
R116	ERJ6GEYJ332V	3.3K 1/10
R117	ERJ6GEYJ123	12K 1/10
R118	ERJ6GEYJ333V	33K 1/10
R119	RRJ6GCJ223TE	22K 1/6
R122	ERDS2TJ104	100K 1/4
R123	ERJ6GEYJ470V	47 1/10
R124	RRJ6GCJ103TE	10K 1/6
R125	RRJ6GCJ222TE	2.2K 1/6
R127	ERDS2TJ681	680 1/4
R128	RRJ6GCJ103TE	10K 1/6
CAPACITORS(VALUE,VOLTAGE)		
C101	ECEA1CKS220I	22 16
C102	ECEA1HKS010I	1 50
C103	ECEA1CKS220I	22 16
C106	RCUV1E104ZF	0.1 25
C107	ECEA0GKS101I	100 4
C108	ECEA0JKS470I	47 6.3
C109	ECEA1HKS010I	1 50
C110	RCUV1H681KB	680P 50
C111	ECUV1C224KR	0.22 16
C112	RCUV1H331KB	330P 50
C113	ECEA1HSN010I	1 50
C114	RCUV1E333KB	0.033 25
C115	ECEA1HSN010I	1 50
C116	RCUV1E333KB	0.033 25
C117	ECBT1H102KB5	0.001 50
C119	ECEA1CKN4R7I	4.7 16
C120	ECEA1CKN4R7I	4.7 16
C122	ECEA0JKS220I	22 6.3
C123	RCUV1E104ZF	0.1 25
C124	ECUV1E823KB	0.082 25
C125	ECUV1C224KR	0.22 16
C127	ECEA0JKF101I	100 6.3
C128	ECEA1CKA101I	100 16
C132	ECUV1E104KB	0.1 25
C133	RCUV1H330KC	33P 50
C134	ECUV1C224KR	0.22 16
C135	ECUV1C224KR	0.22 16
C136	ECEA0GKS101I	100 4
C138	RCUV1E104ZF	0.1 25
C139	RCUV1H470KC	47P 50
C140	RCUV1E103KB	0.01 25
C141	RCUV1H470KC	47P 50
C142	RCUV1H470KC	47P 50
C143	RCUV1H470KC	47P 50
C144	RCUV1H470KC	47P 50
C145	ECEA0JKF101I	100 6.3
C146	RCUV1H181KC	180P 50
C147	RCUV1H472KB	0.0047 50
C148	ECEA1ESN4R7I	4.7 25
C149	RCUV1E104ZF	0.1 25
C150	RCUV1E103KB	0.01 25

■ REPLACEMEN

Notes : * Important safety notic
Components identifie
manufacturer's speci
* Bracketed indication
Parts without these i

Ref. No.	Part No.	
INTEGRATED CIRCUITS		
IC11	LM2940T5	I
IC13	SVIBA4558F	I
IC301	MN6617	I
IC302	SVICXK5816M	I
IC401	MN1554PEW	I
IC402	SVIBA4558F	I
IC601	MN152611PEN	I
IC801	MN6623A	I
IC803	LM833M	I
IC804	NJM4560M	I
IC805	SVIH8DN2175	I
IC806	SVIH8DN2175	I
TRANSISTORS		
Q11	2SB1240-P	T
Q12	2SB1238Q,S	T
Q16	2SD1862-P	T
Q301	DTC124EST	T
Q351	DTA124EST	T
Q401	2SD1862-P	T
Q402	2SB1240-P	T
Q403	2SD1862-P	T
Q405	DTC124EST	T
Q406	DTC124EST	T
Q407	DTC124EST	T
Q408	DTA113ZS	T
Q409	DTC124EST	T
Q801	2SC3311A-Q	T
Q802	2SC3311A-Q	T
Q803	2SD1450RST	T
Q804	2SD1450RST	T
Q851	DTA124EST	T
Q852	DTC124EST	T
Q853	DTA114EST	T
Q854	DTC124EST	T
Q855	DTA124EST	T
Q856	DTA124EST	T
DIODES		
D11 ⚠	SVD1SR35200A	D
D12 ⚠	SVD1SR35200A	D
D13 ⚠	SVD1SR35200A	D
D14 ⚠	SVD1SR35200A	D
D15 ⚠	SVD1SR35200A	D
D16	MA4330M	D
D17 ⚠	SVD1SR35200A	D
D18	MA4062	D
D19	MA4062-H	D
D21 ⚠	SVD1SR35200A	D
D22 ⚠	SVD1SR35200A	D
D401	SVD1SS254	D
D410	MA4033M	D
D411	SVD1SS254	D
D422	SVD1SS254	D
D601	SVD1SS254	D
D602	SVD1SS254	D
D603	SVD1SS254	D
D604	SVD1SS254	D
D606	SVD1SS254	D
D607	SVD1SS254	D
D851	SVD1SS254	D
D852	SVD1SS254	D
D853	SVD1SS254	D
D854	SVD1SS254	D
D855	SVD1SS254	D
D856	SVD1SS254	D
D857	SVD1SS254	D
I.C.PROTECTORS		
ICP11 ⚠	SRUN15	I
ICP12 ⚠	SRUN15	I
[EK]		

Value.
22 16
50
22 16
0.1 25
100 4
47 6.3
50
680P 50
0.22 16
330P 50
50
0.033 25
50
0.033 25
0.001 50
4.7 16
4.7 16
22 6.3
0.1 25
0.082 25
0.22 16
100 6.3
100 16
0.1 25
33P 50
0.22 16
0.22 16
100 4
0.1 25
47P 50
0.01 25
47P 50
47P 50
47P 50
47P 50
100 6.3
680P 50
0.0047 50
4.7 25
0.1 25
0.01 25

■ REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C, REGULATOR
IC13	SVIBA4558F	I.C, REGULATOR
IC301	MN6617	I.C, SIGNAL PROCESSING
IC302	SVICXK5816M	I.C, 16K RAM
IC401	MN1554PEW	I.C, SYSTEM CONTROL
IC402	SVIBA4558F	I.C, REGULATOR
IC601	MN152611PEN	I.C, OPERATION AMP
IC801	MN6623A	I.C, DF & DAC
IC803	LM833M	I.C, OPERATION AMP
IC804	NJM4560M	I.C, OPERATION AMP
IC805	SVIH8DN2175	I.C, LPF
IC806	SVIH8DN2175	I.C, LPF
TRANSISTORS		
Q11	2SB1240-P	TRANSISTOR
Q12	2SB1238QS	TRANSISTOR
Q16	2SD1862-P	TRANSISTOR
Q301	DTC124EST	TRANSISTOR
Q351	DTA124EST	TRANSISTOR
Q401	2SD1862-P	TRANSISTOR
Q402	2SB1240-P	TRANSISTOR
Q403	2SD1862-P	TRANSISTOR
Q405	DTC124EST	TRANSISTOR
Q406	DTC124EST	TRANSISTOR
Q407	DTC124EST	TRANSISTOR
Q408	DTA113ZS	TRANSISTOR
Q409	DTC124EST	TRANSISTOR
Q801	2SC3311A-Q	TRANSISTOR
Q802	2SC3311A-Q	TRANSISTOR
Q803	2SD1450RST	TRANSISTOR
Q804	2SD1450RST	TRANSISTOR
Q851	DTA124EST	TRANSISTOR
Q852	DTC124EST	TRANSISTOR
Q853	DTA114EST	TRANSISTOR
Q854	DTC124EST	TRANSISTOR
Q855	DTA124EST	TRANSISTOR
Q856	DTA124EST	TRANSISTOR
DIODES		
D11 ⚠	SVD1SR35200A	DIODE
D12 ⚠	SVD1SR35200A	DIODE
D13 ⚠	SVD1SR35200A	DIODE
D14 ⚠	SVD1SR35200A	DIODE
D15 ⚠	SVD1SR35200A	DIODE
D16	MA4330M	DIODE
D17 ⚠	SVD1SR35200A	DIODE
D18	MA4062	DIODE
D19	MA4062-H	DIODE
D21 ⚠	SVD1SR35200A	DIODE
D22 ⚠	SVD1SR35200A	DIODE
D401	SVD1SS254	DIODE
D410	MA4033M	DIODE
D411	SVD1SS254	DIODE
D422	SVD1SS254	DIODE
D601	SVD1SS254	DIODE
D602	SVD1SS254	DIODE
D603	SVD1SS254	DIODE
D604	SVD1SS254	DIODE
D606	SVD1SS254	DIODE
D607	SVD1SS254	DIODE
D851	SVD1SS254	DIODE
D852	SVD1SS254	DIODE
D853	SVD1SS254	DIODE
D854	SVD1SS254	DIODE
D855	SVD1SS254	DIODE
D856	SVD1SS254	DIODE
D857	SVD1SS254	DIODE
I.C.PROTECTORS		
ICP11 ⚠	SRUN15	I.C, PROTECTOR
ICP12 ⚠ [EK]	SRUN15	I.C, PROTECTOR

Ref. No.	Part No.	Description
COILS AND TRANSFORMERS		
L1 (EG, EH, EB) (EF, E1, E)	SLQX400-D	COIL
L2 (EG, EH, EB) (EF, E1, E)	SLQX400-D	COIL
T1 ⚠ (EG, EH, EB) (EF, E1, E)	SLTD5K028SE	POWER TRANSFORMER
T1 ⚠ (EK, XL)	SLTD5K029SG	POWER TRANSFORMER
T1 ⚠ (XA, PC, XB)	SLTD5K030SX	POWER TRANSFORMER
OSCILLATORS		
X801	SVQ49U338S	OSCILLATOR
DISPLAYS		
FL601	SAD7MT89ZK	DISPLAY
FUSES		
F1 ⚠ (EG, EH, EB) (EK, EF, E1) (XL, E)	XBA2C012TB0S	FUSE(250V,T125mA)
F1 ⚠ (XA, PC, XB)	XBA2C025TB0	FUSE, 250V, T250mA
F2 ⚠ (EG, EH, EB) (EF, E1, E)	XBA2C08TB0	FUSE 250V,T800MA
SWITCHES		
S1 ⚠	ESB8249V	SW, POWER
S2 ⚠ (XA, PC, XB)	SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD17	SW, LOADING DET.
S102	SSPD18	SW, LOADING DET.
S601	EVQQS405K	SW, OPEN/CLOUSE
S602	EVQQS405K	SW, STOP
S603	EVQQS405K	SW, PAUSE
S604	EVQQS405K	SW, PLAY
S605	EVQQS405K	SW, REPEAT
S606	EVQQS405K	SW, PRGM/CONT/MEMO
S607	EVQQS405K	SW, BACKWARD
S608	EVQQS405K	SW, FORWARD
S609	EVQQS405K	SW, PRE EDIT
S610	EVQQS405K	SW, TIME MODE
JACKS		
JK401	SJJ130-3	JACK, SYNCRO REC
JK402	SJJ130-2	JACK(REMOTE)
JK801	SJFD4	OUTPUT TERMINAL(PHONO)
SERVO P.C.B.		
INTEGRATED CIRCUITS		
IC101	AN8373S	I.C, SERVO AMP
IC102	AN8374S	I.C, SERVO PROCESSOR
IC103	AN8377	I.C, B.T.L DRIVE
IC104	LM2940T5M	I.C, RESET
TRANSISTORS		
Q101	2SA1547QSTV2	TRANSISTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B14	V.R, BEST EYE ADJ.
VR102	EVND3AA00B14	V.R, TRACKING GAIN ADJ.
VR103	EVND3AA00B14	V.R, TRACKING OFFSET ADJ.
VR104	EVND3AA00B14	V.R, FOCUS GAIN ADJ.
VR105	EVND3AA00B14	V.R, FOCUS OFFSET ADJ.
VR106	EVND3AA00B24	V.R, TRACKING BALANCE ADJ.
MAGNET RESISTOR ELEMENTS		
RA1	EWS7M0A00Q53	RESISTANCE UNIT

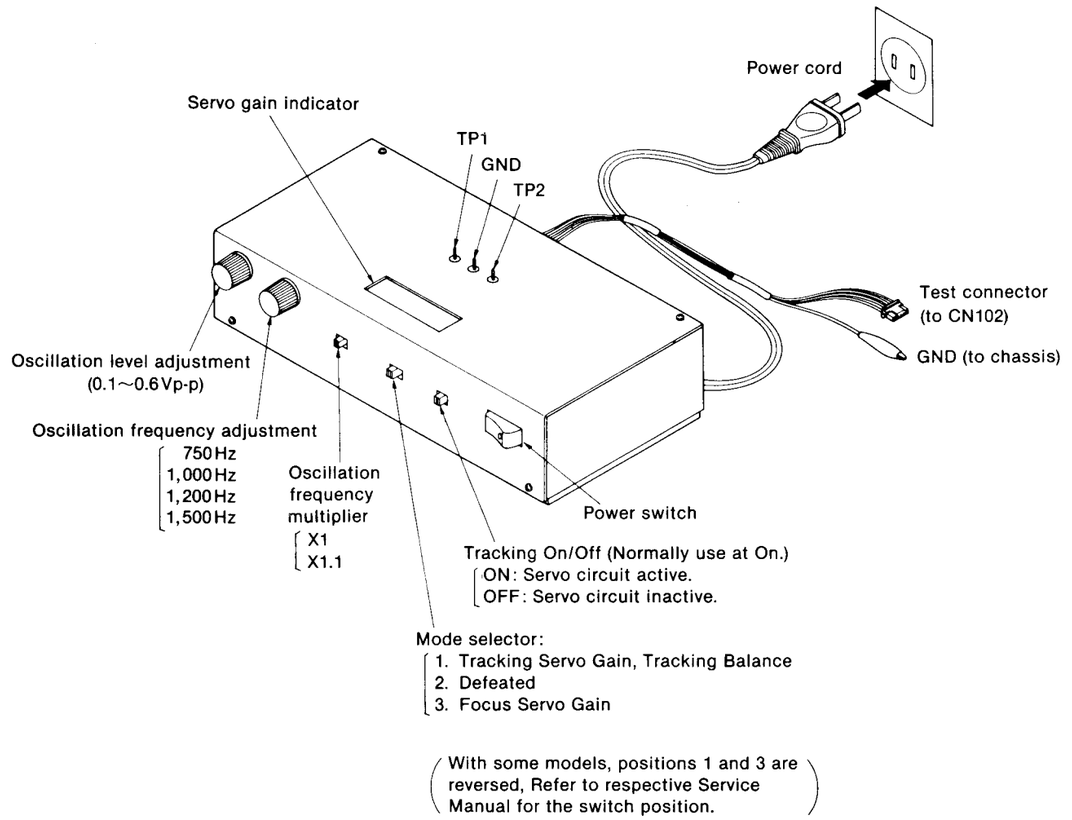
■ NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)

The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C

Features:

(1) Contains all oscillation frequencies and output adjustments needed for focus servo gain, tracking servo gain, and tracking balance adjustment (requires no external oscillator).
(2) Panel indicators indicate the best points of focus and tracking servo gains (no oscilloscope needed).
(3) Internal power supply eliminates the need for power supply from the CD player.



(With some models, positions 1 and 3 are reversed, Refer to respective Service Manual for the switch position.)

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